FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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Flight

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EDITORIAL COMMENT

FROM the point of view of those interested in civil aviation, the Air Estimates, which were issued on Saturday last, can only be described as disappointing to the last extreme. They include an allocation of £880,000 net for the civil side, but this is mainly accounted for by pay, allowances and salaries of staff and for ground services. The subsidy grant remains at the ridiculous figure of £60,000, in spite of the knowledge gained since the announcement of the subsidy as to what France is actually doing and what is in contemplation by other countries. It really begins to look as though the Government were determined that civil aviation in this country should die out altogether—killed by subsidised foreign competition and want of encouragement here.

The Air Estimates

In view of the parsimony of the Government toward civil aviation as an active movement, it is interesting to dissect the particulars of Vote 8, dealing with the Department of Civil Aviation. One of the principal items which strikes us is the sum of £148,000 under the heading of "Wages of Civilian Personnel." What on earth is all this money being spent for, *when there is no civil aviation?* Is it to sit down at Waddon and Cricklewood to watch French, German and Dutch machines in and out? Another item which impresses us most unfavourably is one of £59,000 for "Stores (except Technical) and Transport." This item covers such details as hire of accommodation, fuel, light, water, sanitary services and general stores; medical stores and equipment; and transport and subsistence. The latter accounts for no less than £22,000. But what for if there is no civil aviation?

Not for a moment would we desire that a single penny should be "economised" on essential services, since we regard all expenditure on civil aviation proper as money well invested. Taken on the lowest of valuation planes, it can be regarded as an insurance on our national security. But if there is no civil aviation to be administered—and there is not at the moment—why on earth should the Government be wasting public money on these services in a time of national financial stringency like the present? It is utterly useless from the point of view of the British industry, which is, to our mind, the only thing upon which British money should be spent. If the Government wants to expend the taxpayers' money on assisting and fostering French, German and Dutch civil aviation, why not say so plainly, and let us be done with it? The whole Vote for civil aviation simply makes us boil. Nearly £900,000 of the taxpayers' money is being spent on a Department *to look after just nothing at all*, and at the end, under a sub-heading "Miscellaneous," which includes items like "cablegrams," there figures the beggarly sum of £60,000 to subsidise an industry which the Government itself, tongue in cheek, has told the country is vital to its existence. And only on Monday last the French Chamber passed the Air Vote—particulars of which were given recently in FLIGHT—without explanation or discussion; it was taken almost as read! The Air Ministry can spend nearly £30,000 a year on messenger services without question; half as much as can be found, after endless haggling, to sustain actual civil aviation. Faugh!

We cherish a sincere hope that when these Estimates come before the House this week for discussion

a very serious effort will be made to bring the Government to see reason and to extend to civil aviation the help that has been promised again and again, only to be withheld altogether or given in so niggardly a manner as to be completely ineffective. Unfortunately, the general public does not even yet appreciate to what an extent the future safety of the Empire is bound up with the dominion of the air. If a complete understanding did exist, the country would insist upon the Government taking what is, in our view and that of everybody who has given serious thought to air problems, the only possible course leading to safety. As it is, we could almost imagine ourselves back in the days before the War, when the smug spokesmen of the Government of the time spoke of aviation as something which was a scientific curiosity, perhaps possessing possibilities of usefulness, but of a very problematical character. In any case, said they, it was not the custom of the British Government to initiate or experiment, and we should pursue our ordinary plan of allowing others to do the experimenting and of coming in if and when the new thing had been proved of some practical use. As to subsidising or otherwise assisting the pioneer firms who were endeavouring, with painfully restricted means, to turn aviation into something concrete and really useful, we had never done anything of the kind. It was our invariable policy to avoid subsidies and allow industry to make good by its own unaided efforts or fall by the wayside.

We know only too well what the result of that policy was and what it cost us in money and effort to make good the leeway when the War came. We have a shrewd idea that if we should again become involved in war we shall not be allowed the time or opportunity to make good again. It may be that the Government believe that never again shall we go to war with a great Power, and that, therefore, it does not matter whether we have aircraft and the men to man them or not. If that is their belief, then for Heaven's sake let them say so. That would at least constitute a policy, whereas now there is none of any kind. We are very much of opinion that a policy which is frankly bad is better than none at all. It has at least the merit of letting the country know where it stands. In which case why not scrap the entire Air Estimates and have done with it. That would anyway save the taxpayer *something*.

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More Education Needed

The truth of the whole matter is that we shall never, as we have often said in these columns, get anywhere at all until the public as a whole has been educated up to the same understanding of the real meaning of air power as it has of that of sea power. If we needed a case to prove the point, we had it at Olympia the other day when a meeting was held, under the presidency of Sir John Baird, to discuss air transport efficiency. Mr. H. White Smith emphasised the many advantages of air transport, predicting a great increase during the next 20 years. He said very truly that the great difficulty in this country was to get people to take the long view and to finance the operation of services. Not only is it hard to find private individuals and syndicates who have the necessary vision, but the Government, as we know, suffers from the same narrowness of outlook. Mr. White Smith said very truly that it is false economy to neglect the development of a form of national defence which can be run on business lines. Gen. Brancker said the present plight of the industry was the fault of the Government. We now had, he said, a very fine Civil Aviation Department, but no civil aviation.

Now, we know that the main argument held out for the Government support of civil aviation is that its encouragement is vital to the defence of the Empire. Were it not so, then we should be content to accept the thesis that, like any other industry, it must stand on its own feet. Yet one Major Hardie entered the discussion, and urged that air transport is a luxurious and uneconomical form of transport, and that, as the Government had not given its support to railways and shipping in their infancy, he protested against any subsidy being granted to civil aviation, which had no economic possibilities for the shareholders. That is, in the circumstances, a narrow and short-sighted view, and although we have no desire to speak too strongly, we cannot refrain from saying that such views are born of complete ignorance of the bearing of civil aviation on future defence. That is really the whole case for the industry and the movement. We do not agree that it has no economic possibilities, but even that is beside the point for the moment. If there were none, we should still say that it is vital that a strong industry should be supported, because without it we cannot have an adequate Air Force available in time of need. Clearly the best, as well as the cheapest, method of preparing for military possibilities is to foster the means of providing the essential material and *personnel* in time of peace. In so far as the air is concerned, every authority is agreed upon the best methods of ensuring this. Obviously, what is required is a better education of the public in the relation of aviation to our future security.

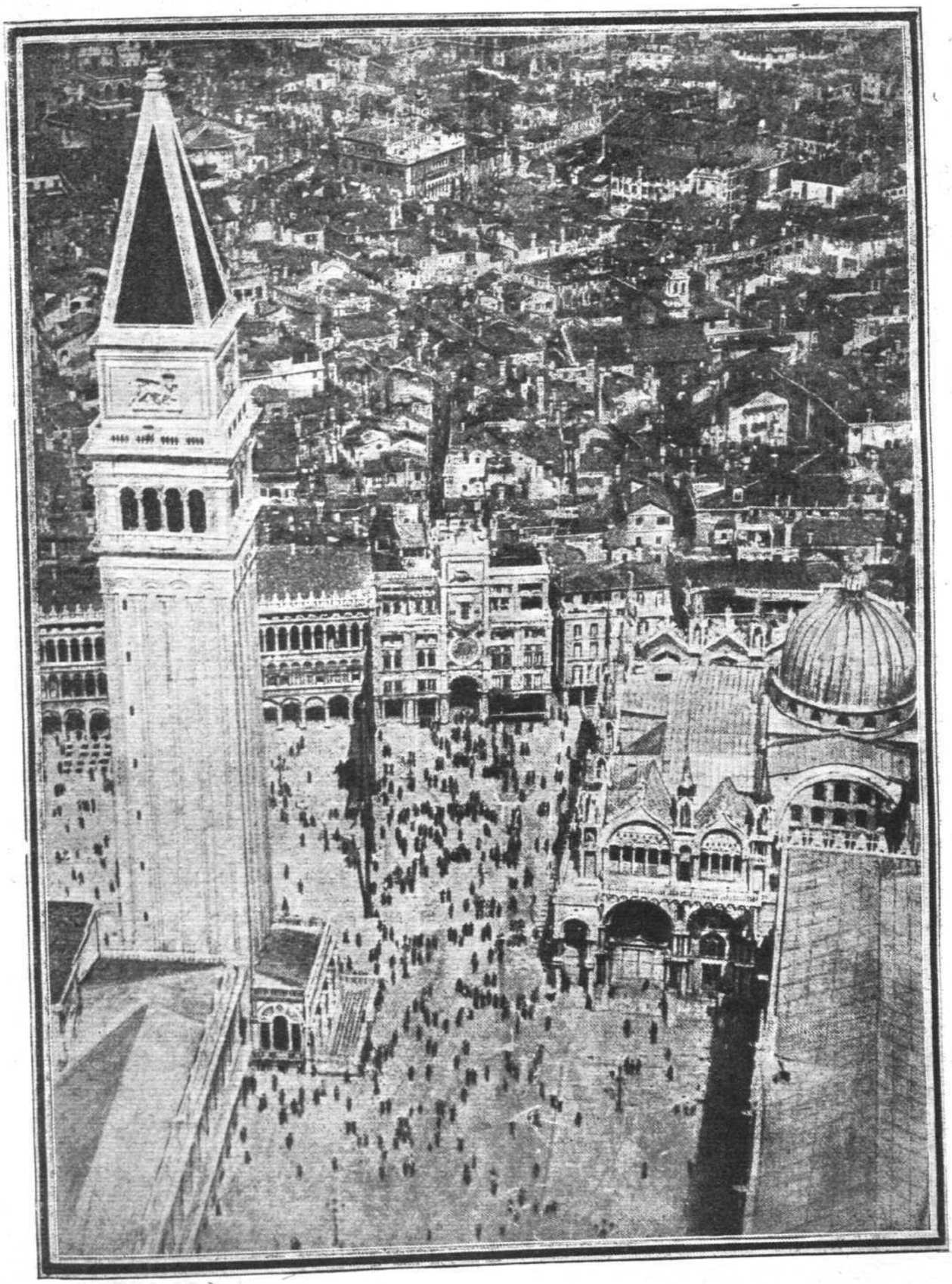
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Is Air Transport Uneconomical?

In our last article we have referred to the statement that air transport is uneconomical and luxurious. Before people allege that this is the case, we submit that they should study all the facts which have a bearing on the question of economy. Even the most prejudiced must admit that there is something in the adage that time is money. If there is, then it becomes very clear that in certain cases air transport is by far the most economical form of transport that has, so far, been evolved. For example, we have before us figures relating to aerial mail services in Australia and in particular to a service operating between Sydney and Adelaide. The distance between these two places is, roughly, 1,060 miles, and so bad are the railway communications that it takes no less than 139 hours 20 minutes to travel from one to the other. By air the journey is accomplished in 10 hours 40 minutes, actual running time—a saving of nearly 5½ days. Surely, the air in this case affords quite the most economical method of transport available.

It may be true that no transport is to be judged by the results of any specific example such as this. But it is equally true that its suitability where conditions are similar can be very adequately assessed by the standard of such an example. Taking Australia again as the text, distances in that continent are great and means of communication on land generally bad except in urban areas and between a few of the larger towns and cities. It is safe, therefore, to lay it down that aviation can and will play a great part in quickening up communications

The Camera and the 'Plane



VENICE AS SEEN FROM AN AEROPLANE: The groups of dots are *not* the famous pigeons or any other sort of "fly," but just ordinary humans.

and in opening the less known parts of the country to development. At the present time there are many families settled in the " back blocks " whose existence is one of almost complete isolation, and if communication can be opened up with civilisation it will give a tremendous impetus to pioneering and the settlement of vast tracts of country which at present is unproductive.

The Last British Service Dies

Organised British civil aviation died on Monday last, with the ceasing of the Handley-Page cross-Channel service, which has been killed by the forward policy of the French Government and the complete apathy of our own. In making the announcement that the service is to cease, the " Handley Page Bulletin " says that : " British civil aviation will cease to exist unless the British Government decides upon a radical modification of the proposed subsidy of £60,000, the terms of which are utterly hopeless in comparison with the French subsidy. . . . Subject to the French aviation companies reducing their rates to proportions which, in the view of the French Air Ministry, will popularise the air routes for passengers and freight, payment will be made to the French companies at the rate of 8 francs per kilometre actually flown by single-engined machines and 12 francs per kilometre by twin-engined machines. Further, in order to ensure machines of the most modern construction, 50 per cent. of the money required by civil aviation companies for new machines will be provided by the Government. On the other hand, the French officials will insist upon every subsidised company maintaining not less than fourteen twin-engined machines and twenty-eight single-engined aeroplanes. . . . The French Air Ministry is taking an active interest in popularising aviation by throwing open all aerodromes every Sunday to ex-military aviators who have returned to civil life, and placing at their disposal free of cost machines borrowed from the aviation companies, as well as free petrol for joy-flights and training. The Government will even insure the civilian aviators at the rate of 50,000 francs a head during their flights, and in the event of accidents to machines the Government will pay the damage. Comparisons are odious, but it must be obvious to all that the British Air Ministry has not yet realised the necessity of giving adequate support to British civilian aviation."

There is little need for us to comment upon the facts, which are there in all their naked uncomeliness to speak for themselves. We may say this, however, that we think the " Handley Page Bulletin " does a little less than justice to the Air Ministry. We do not believe that the position which has arisen is to be laid at the door of the Ministry. In all our dealings and conversations with officials of the Air Ministry we have almost invariably been impressed with the breadth of outlook shown and with the sincere desire present to see British civil aviation develop. Moreover, there has been present more than a tacit acknowledgment that it is up to the Government to find the money to tide civil aviation over the period of infancy, not only because of its possibilities merely as a means of transport, but because of its intimate bearing on what is, after all, the first task of the Ministry—to secure this country and the Empire generally against attack from the air.

The fault lies in another place. It is with the Cabinet, which takes no account of granting money by the million for doles to those who have no work to do and who, in very many cases, do not want it, but turns up its eyes to the heavens and murmurs " Economy " when there are no votes concerned. So far as Mr. Lloyd George and his colleagues of the Cabinet are concerned, we are forced to the conclusion that they care nothing at all whether civil aviation lives or dies, in spite of its proven value to the nation. We say with all seriousness that they are deliberately gambling with the safety of the State, taking refuge behind the knowledge that there will be no great War in their time as a Government. Their policy is what it has always been, one of sheer opportunism and of dealing today with the problems which carry the votes of the proletariat and leaving the rest to be settled with by their successors of tomorrow or the day after.

It is to be hoped that Mr. Churchill will have something helpful to say about the position in which British civil aviation finds itself when he introduces the Air Estimates. Until then, it will be well to withhold further comment.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN FEBRUARY 13 AND FEBRUARY 26, INCLUSIVE

Route‡	No. of flights*	No. of passengers	No. of flights carrying Mails	No. of flights carrying Goods	No. of journeys completed†	Average flying time	Fastest time made by	Type and No. (in brackets) of Machines Flying
						h. m.		
Croydon-Paris	14	11	6	11	13	2 42	Spad F-CMAY (2h. 13m.) ...	B. (3), G. (2), Sa. (1), Sp. (3).
Paris-Croydon	17	21	7	15	13	3 2	Goliath F-GEAD (2h. 4m.)	A.9 (1), B. (3), G. (2), Sa. (1), Sp. (3).
Cricklewood-Paris ...	6	15	5	6	5	2 58	Airco 9 G-EAUI (2h. 29m.)	A.9 (2), H.P. (2).
Paris-Cricklewood ...	5	5	3	4	4	3 0	H.P G-EATM (2h. 40m.) ...	A.9 (2), H.P. (2), Se. (1).
Croydon-Brussels ...	9§	5	6	7	9	2 34	Airco 4 O-BADO (1h. 49m.)	A.4 (3), A.9 (3).
Brussels-Croydon ..	8§	5	8	5	7	2 13	Airco 4 O-BABI (1h. 58m.)	A.4 (3), A.9 (3).
Totals for two weeks...	59	62	35	48	51			

* Not including " private " flights. † Including certain journeys when stops were made *en route*.

‡ Including certain diverted journeys. § One from and to Cricklewood.

A.4 = Airco 4. A.9 = Airco 9 (etc.). Av. = Avro. B. = Breguet. Br. = Bristol. Bt. = B.A.T. F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. N. = Nieuport. P. = Potez. Sa. = Salmson. Se. = S.E. 5. Sp. = Spad. V = Vickers Vimy. W. = Westland.

FLIGHT

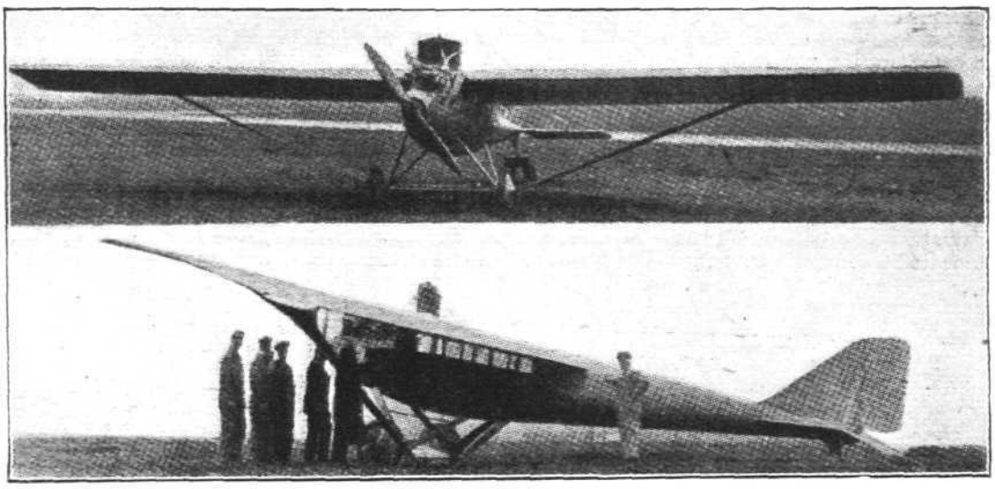
THE JACUZZI SEVEN-SEATER MONOPLANE

AN interesting American commercial 'plane has been constructed by Jacuzzi Bros., of Berkeley, California, in which are incorporated several novel features. We give below some particulars of this machine, which appear in our American contemporary *Aerial Age*. It is a monoplane having externally braced wings of a comparatively thin section, giving a high maximum L/D at low angles of incidence and high speed. The chord of the wings tapers considerably from root to tip, which enables a uniform wing section to be employed throughout, and at the same time giving a deeper section at the root—a feature possessing advantages from a structural point of view. The wings are of wood construction, fabric covered, and are attached, high up on the *fuselage*, to a "centre section" which forms the roof of the cabin. They are braced by a streamline sectioned strut under each wing, there being no top bracing. These bracing struts are anchored at their lower and inner ends to the landing chassis tie-rod just aft of the wheels, and the top and outer extremities, which terminate in a Y-head, are attached to heavy metal fittings on the main wing spars at a point about two-thirds out on the wing. The wings are set at a slight dihedral angle, and *ailerons* are hinged to the outer ends of the rear spars.

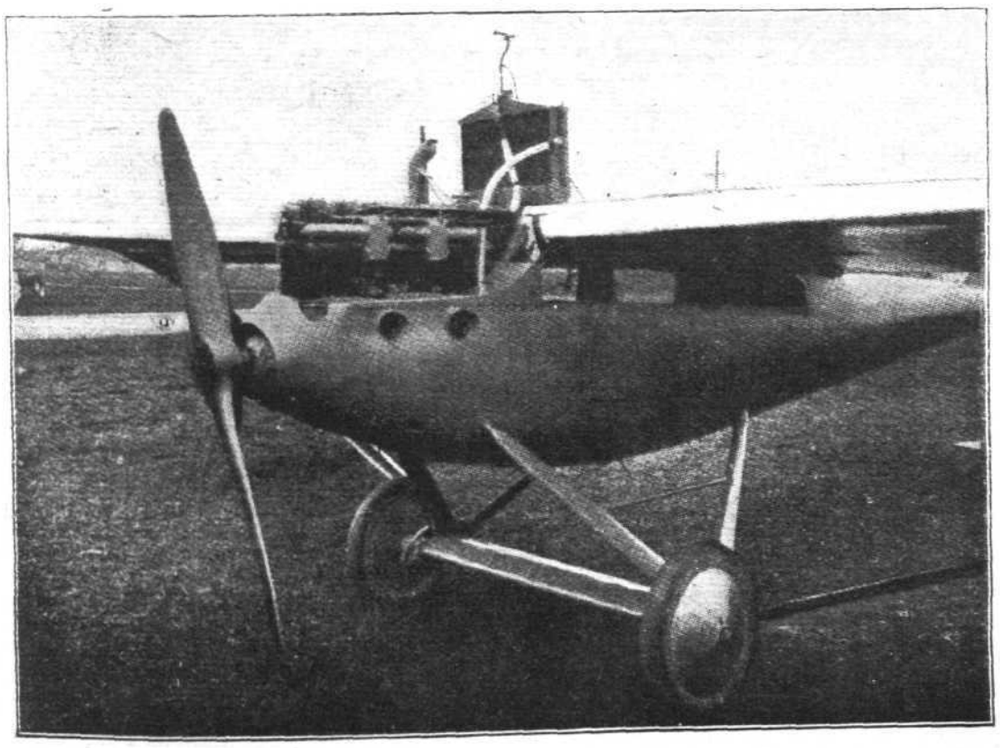
The *fuselage* is of a very clean streamline form, and is, considering the number of passengers carried, of comparatively small proportions. It is built up of six main longitudinals $1\frac{5}{8}$ in. by $\frac{7}{8}$ in. and 18 auxiliary members $\frac{7}{8}$ in. by $\frac{3}{8}$ in., all supported by 14 ply-wood bulkheads. The covering is of $\frac{1}{4}$-in. ply-wood. The rear extremity of the *fuselage* consists of an aluminium casting containing the bearings for the rudder and elevators.

The seats are arranged in three tandem rows, the first seating two—pilot and passenger or two pilots—the second holds three and the third two. In front of the cabin at the leading edge of the wings and on each side of the engine is a window through which a good forward view is obtained. These windows may be cleaned when required from openings provided at the sides. On each side of the cabin are large windows giving an unobstructed view below. Access to the cabin is obtained by a door in the left-hand side of the *fuselage*, the seats, on that side, of the first and second rows hinging out of the way.

A 200 h.p. L-6 Hall-Scott engine is installed, driving a tractor screw of 8 ft. 2 in. diam. At normal horizontal flight (100 m.p.h.) the engine is required to run at only half-throttle, so that there is an ample reserve of power. Every possible precaution against fire has been taken in the installation of



The Jacuzzi Seven-Seater Monoplane: Front and side views.



The Jacuzzi Seven-Seater Monoplane: Close-up view, showing the cabin, engine, etc.

the engine, for instance, the breather pipes, which are of aluminium, are carried up clear above the centre section, and air is taken to the carburettors through air scoops located on the outside of the *fuselage*. The petrol is carried in tanks mounted in the wings and connected to the carburettors by large copper pipes with flexible couplings. Fan driven pumps deliver petrol to the highest point in each tank, thus maintaining a constant gravity head at all fuel levels. Overflow from the carburettors is conducted outside the *fuselage* by pipes.

The radiator is mounted high up on the centre section, immediately behind the engine. It is provided with a heavy canvas shutter which can be set at any desired position whilst the machine is in flight. The air-speed venturi tube is mounted above the radiator, out of the air screw slip stream Delco ignition, and two Stromberg carburettors are fitted, the ignition levers, together with the throttle lever, being located in a central position forward of the front seat. The levers operating the radiator shutter are in the cabin roof, within easy reach of the pilot. Dual, or single, stick control is fitted, and the rudder is operated by two sets of interlocked pedals and a double set of cables entirely enclosed within the *fuselage*.

The landing chassis is especially interesting. The two 750 by 125 wheels are spaced fairly wide—7 ft.—and are carried on a 2 in. tubular axle sprung by rubber cord to two V-struts. The axle, which has a vertical movement of 6 ins., is located a few inches forward of the apexes of the V-struts and forms the leading edge of an aerofoil-like fairing connecting the axle and the tie-rod to which the wing-bracing struts are attached. The axle being free to move vertically, this fairing pivots, of course, about its trailing edge, which is formed by the tie-rod. A tube connecting the front and rear left-hand struts serves as a step when entering the cabin. The struts are of ash, and are attached to the *fuselage* by strong pinned ball and socket fittings; the Vs are wire braced transversely. A curved leaf-spring tail skid is fitted.

In actual flight this machine has proved remarkably efficient, as might be expected judging by the clean design throughout. The principal characteristics of the Jacuzzi monoplane are :—

Span	52 ft.
Overall length	29 ft.
Overall height	10 ft. 6 in.
Wing area	400 sq. ft.
Weight empty	1,800 lbs.
Weight fully loaded	3,400 lbs.
Fuel capacity (2 tanks)	80 galls.
Oil capacity	4 galls.
Fuel consumption per hr.	8-9 galls.
Radius of action	900-1,000 miles.
Speed, half-throttle	100 m.p.h.
Speed, three-quarter	125 m.p.h.
Landing speed (full load)	45 m.p.h.
Landing speed (half-load)	38 m.p.h.
Approximate	22,000 ft.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ANNUAL GENERAL MEETING

THE Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

Notices of Motion for the Annual General Meeting must be received by the Secretary not less than twenty-one days before the Meeting, and must be signed by at least five Members.

Committee

In accordance with the Rules, the Committee shall consist of 18 Members. Members are elected to serve for two years, half the Committee retiring annually.

Retiring Members are eligible for re-election.

The retiring Members of the Committee are :—

Lieut.-Col. John D. Dunville.
Lieut.-Col. Spenser D. A. Grey, D.S.O.
Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.
Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.
Lieut.-Col. F. K. McClean.
Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.
The Viscount Northcliffe.
Lieut.-Col. Alec Ogilvie.
F. Handley Page.

Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and Lieut.-Col. Spenser D. A. Grey, D.S.O., will be going abroad shortly, and do not offer themselves for re-election.

Any two Members of the Club can nominate a Member to serve on the Committee, provided the consent of the Member has been previously obtained. The name of the Member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the Annual General Meeting.

International Seaplane Race

The Royal Aero Club has decided to contribute £1,000 towards the expenses of the British representatives competing in the International Seaplane Competition for the Jacques Schneider Trophy, to be held in Venice in September.

Italy is the present holder and each Country is entitled to challenge with three competitors. The Royal Aero Club will select the three competitors to represent Great Britain, and all enquiries should be addressed to the Secretary.

Gordon Bennett International Balloon Race 1921

The International Gordon Bennett Balloon Race will be held this year at Brussels in September next.

The British competitors will be selected by the Royal Aero Club, and anyone wishing to compete should communicate at once with the Secretary.

Offices : THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W.1.

H. E. PERRIN, Secretary.

King Albert Receives the D.F.C.

As already announced in FLIGHT, the King has awarded the Distinguished Flying Cross, which, it should be remembered, is the only War decoration in the world which is awarded to officers solely for gallantry in the air, to His Majesty the King of the Belgians for personal gallantry during the War, and the actual investment was made on February 24 in Brussels by Wing-Commander His Royal Highness the Duke of York, who travelled to Brussels on February 24 specially for this purpose. His Royal Highness was accompanied by the following Royal Air Force Officers :—Comptroller and Equerry Wing-Commander L. L. Greig, M.V.O.; Air-Commodore C. L. Lambe, C.B., C.M.G., D.S.O.; Air Commodore F. C. Halahan, C.M.G., D.S.O., M.V.O.; and Group-Captain C. L. N. Nowall, C.M.G., C.B.E., A.M.

A Guard of Honour was provided by the Royal Air Force at Dover.

The continual presence of His Majesty the King of the Belgians in the field with his army is well known; but what is not so well known is the fact that on many occasions His Majesty was flown over the lines in British aircraft in order that he might personally reconnoitre enemy positions. For essential reasons this information was withheld during the War.

Sir H. M. Trenchard appointed Principal Air Aide-de-Camp to H.M. the King

THE Air Ministry announces that the King has been graciously pleased to approve of the appointment of Air-Marshal Sir Hugh Montague Trenchard, Bart., K.C.B., D.S.O., Chief of the Air Staff, to be Principal Air Aide-de-Camp to His Majesty.

It is understood that Sir Hugh is likely to accompany Mr. Winston Churchill on his journey to Egypt with the object of investigating the possibilities of replacing the armies of occupation in Mesopotamia and Egypt with units of the R.A.F.

It is to be hoped that Mr. Churchill will support Air-Marshal Trenchard's suggestions for the garrisoning of the East, as this will enable the Army forces to be greatly reduced, whilst the cost of maintaining the Air Force will be a great deal less than that of maintaining the present Army.

FLIGHT

AIR ESTIMATES

AIR estimates for 1921-22, issued on Saturday, show a reduction on the revised figures for the current financial year, presented to Parliament in December. The decrease is £4,581,230, notwithstanding that provision has to be made for the maintenance throughout the twelve months of the five additional squadrons which it was decided to form three months ago.

The gross total is £19,033,400, but appropriations in aid bring this figure down to £18,411,000. On the other hand, expenditure on account of the Force is provided for under various Civil Service votes (buildings, works, stationery, research, etc.), to the amount of £596,991, so that the actual total net estimate works out at £19,007,991, against a corresponding figure for the current year of £23,406,795.

Apart from the expenditure borne on the votes of other departments, the totals for the two years compare as under :—

	£
Net estimates, 1921-22	18,411,000
Revised estimates, 1920-21	22,992,230
Net reduction	£4,581,230
Numbers, all ranks, 1921-22	30,880
Numbers, all ranks, 1920-21	29,730
Increase	1,150

The general abstract of the estimates gives the following net figures under the various heads of expenditure :—

	£
Pay, etc., of the Air Force	4,794,000
Quartering stores (except technical), supplies, and transport	3,105,000
Technical and warlike stores	3,758,000
Works, buildings, and lands	3,018,000
Air Ministry	915,000
Miscellaneous effective services	129,000
Civil aviation	880,000
Experimental and research services ..	1,706,000
Half-pay, pensions and other non-effective services	106,000
Total	£18,411,000

As regards establishment, the number on the strength of the active Force, exclusive of officers and men serving in India, is made up as follows :—

Air officers ..	12	Airmen ..	21,845
Commd. officers	2,769	Boys	2,191
Cadets ..	135		
Warrant officers	329	Total ..	30,714
Non-coms. ..	3,433		

The remainder consists of seven air officers, 125 commissioned officers, and five other ranks attached to the Air Ministry; five commissioned officers and ten other ranks serving in the Department of Civil Aviation, and fourteen commissioned officers engaged in experimental and research services.

Aeroplanes and Munitions

Under the head of pay and allowances—with which there is a net decrease of £162,850—the principal items are : £1,501,000 for officers and £2,065,000 for men ; £250,000 for separation and marriage allowances ; £793,000 for civilians (comprising the staff of educational establishments, stores, etc.) ; £115,000 for the Air Force Reserve ; £20,000 for the Territorial Air Force ; and £122,000 for recruiting staff and expenses, including £60,500 to cover bounties on re-engagement or extension of service.

There is a net decrease of £5,163,550 under the head of technical and warlike stores, due mainly to the fact that the current year's estimates included some six and a half millions on account of aircraft supplies delivered under war contracts. The principal sub-heads compare as follows :—

	1921-22.	1920-21.
	£	£
Aeroplanes, seaplanes, and engines ..	1,681,000	1,352,750
Airships and airship engines	16,800	37,000
Aircraft technical and warlike stores ..	49,000	89,200
Armament and ammunition	249,500	240,400
Miscellaneous materials	116,000	126,500
Mechanical and other transport ..	581,000	427,700
Petrol and oil	471,000	477,500
Rewards to inventors	700,000	450,000

The vote for works, buildings, and land includes £1,888,550 for new works, additions and alterations ; £668,500 for repairs, renewals, and maintenance ; and £230,000 for purchase of land and buildings. Among works which appear on the estimates for the first time are five stations in the Suez Canal zone, estimated to cost £670,000, of which £163,250 is to be voted in 1921-22.

In respect of civil aviation there is a net increase of £458,760, the chief items of expenditure being : Works, buildings, and land, £356,000 ; salaries and wages, £178,000 ; technical equipment, £120,000 ; and meteorological services, £102,000. Buried under " Miscellaneous " £82,000, in which are included compensation, cablegrams, advertisements, etc., is the subsidy of £60,000 to Civil Aerial Transport Companies. The first sub-head includes provision for an aerial lighthouse at Lympne, and for landing and other lights, mooring masts, etc., at various stations at home and abroad. Experimental and Research Services show a net decrease of £132,440, the net total for the year being £1,706,000. After allowing for the smaller amounts required for Royal Airship Works, Cardington, liquidation of War liabilities, and smaller appropriations in aid, the net total for these services will have the benefit of an increase sum of £362,560.

The Air Estimates, which were up for discussion on Tuesday this week, are referred to in the following explanatory statement by Mr. Winston Churchill, Secretary of State for Air, which accompanies the Estimates :—

The gross total of the Air Estimates as now presented to the House of Commons is £19,033,400 ; the estimated appropriations-in-aid are £622,400, leaving a net total of £18,411,000. The latter sum is less by £4,581,230 than the corresponding total for 1920-21 of £22,992,230, voted in the Supplementary Estimate taken in December, 1920.

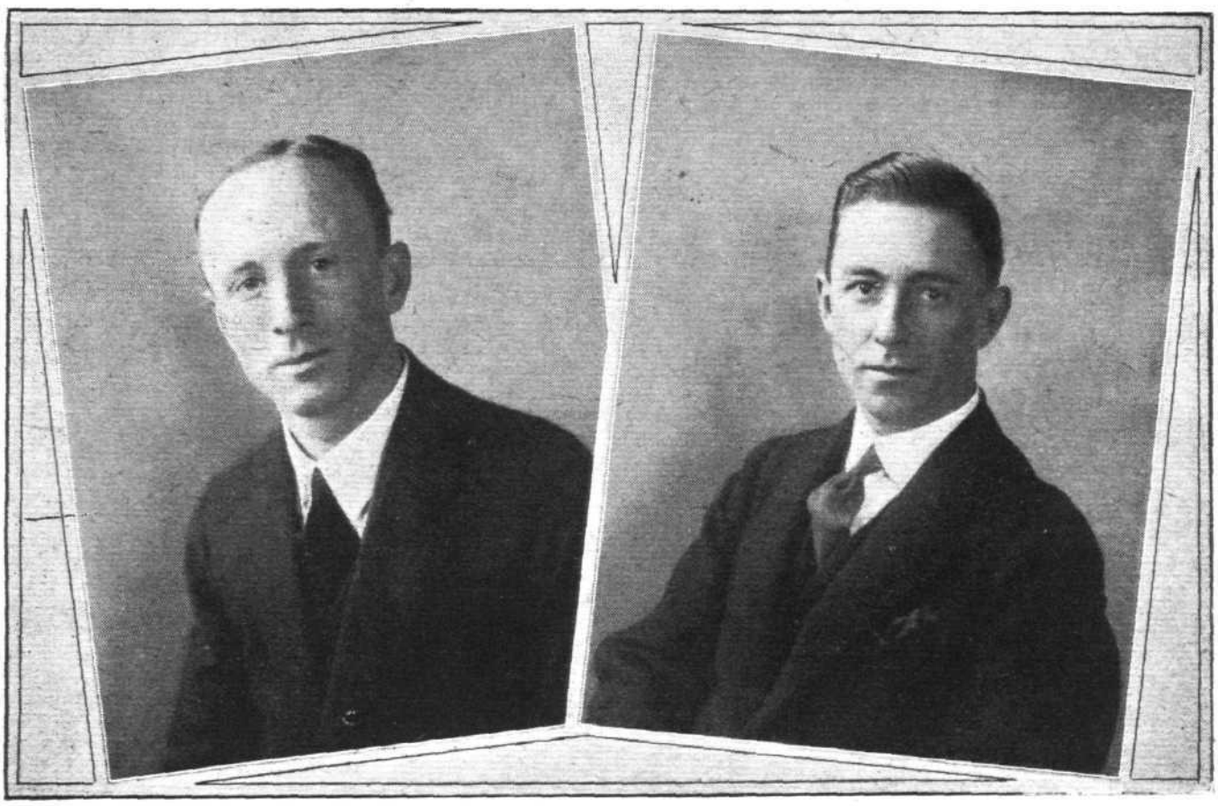
The totals for 1921-22 include a gross war liability of £1,585,000, and war credits amounting to £114,000, making a net war charge of £1,471,000. Excluding war liabilities the net total of the Estimates is £16,940,000, as compared with £14,998,230 in 1920-21. This latter sum was, however, a revision of one of £15,173,430 originally sanctioned but not fully spent, the Supplementary Estimate of December, 1920, being wholly due to an unexpected increase of war liabilities. The under-spendings embodied in the revised estimate for 1920-21 were actually more considerable than would appear from these figures, since they were partially offset by expenditure on new services which had become necessary. The effect of these under-spendings has been in part to defer expenditure to 1921-22 ; and even where that has not been the case the causes of under-spending are not expected to operate equally in the coming year.

The Estimates for 1921-22 include provision on the whole of the financial year in respect of the five additional squadrons, initial expenditure on which was included in the recent Supplementary Estimate. The increase of " normal " expenditure is more than accounted for by this cause, taken in conjunction with the increased prices of labour, material and transport over those prevailing when the Estimates for 1920-21 were framed. In order to obtain the figure of £18,411,000, every item of these Estimates has been subjected to the most stringent scrutiny, and all services have been curtailed on which, although in themselves desirable, expenditure cannot be fully justified in view of the present financial stringency. To relieve the works and buildings vote, temporary accommodation is wherever possible being improved in preference to the more expensive alternative of capital expenditure on new buildings. It has been decided, after consultation with the Admiralty, to suspend the Royal Air Force Airship service. The maintenance of such a service for fighting purposes at considerable expense would have involved a diminution of effort on services of which the fighting value has been more fully demonstrated. This step will result in considerable economies, although provision has to be made during the next few months for the liquidation of various outstanding liabilities.

With a view to encouraging the development of civil aviation in a time of difficulty, it is proposed, with the sanction of Parliament, to devote a sum not exceeding £60,000 to the grant of subsidies to civil aerial transport companies under the terms of Lord Weir's report. The total sum allocated to civil aviation (including meteorological services and the cost of headquarters staff) is again £1,000,000.

Experimental and research services cannot be unduly stinted, if the science of aviation is to progress ; and although the programme of work for the coming year has been kept within modest limits, there is a considerable carry-over, and the total provision for research is much the same as that originally made in the Estimates for 1920-21.

HONOURING THE ENGLAND-AUSTRALIA AIR PIONEERS



Sir Ross Smith and Sir Keith Smith

THE two notable functions in honour of the brothers Sir Ross Smith and Sir Keith Smith duly took place last week, and both were evidence of the high regard in which those in the Homeland regard these two "Blazers of the Trail" across the world to Australia. On Wednesday, at the invitation of the Overseas Club and Patriotic League, the pilots received a splendid welcome back to England, Major-Gen. J. E. B. Seely occupying the Chair. Amongst those present were Capt. P. D. Acland; Col. the Hon. Sir James Allen, K.C.B.; Major-Gen. Sir W. S. Brancker, K.C.B., A.F.C.; Sir Charles Bright, F.R.S.E.; Lt.-Col. Sir George McL. Brown, K.B.E.; Gen. W. B. Caddell; Major L. Cox; Col. E. A. Ewart; Admiral the Hon. Sir E. R. Fremantle, K.C.B., C.M.G.; Mr. E. P. Frost, J.P.; Sir H. L. Galway, K.C.M.G., D.S.O.; Mr. Claude Johnson; Sir W. Joynson-Hicks; the Hon. Sir Edward Lucas, J.P.; the Hon. Sir Peter McBride; the Earl of Meath, K.P.; Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; the Hon. M. L. Moss, K.C.; Lord Herbert Scott; Mr. Stanley Spooner; Sir Campbell Stuart, K.B.E.; Mr. Douglas Thorburn; Major C. C. Turner; the Hon. F. C. Wade, K.C.; Mr. H. W. Weald; Mr. E. Wrench, C.M.G., etc.

Messages of welcome were read by Mr. Evelyn Wrench, Chairman of the Club, from Mr. Winston Churchill, Lord Northcliffe, and Sir Frederick Sykes, who were prevented from being present.

In proposing the toast of the Guests, General Seely said it was an historic occasion. Sir Ross and his brother were the first to fly from London to their home in Australia. At the outbreak of war there were three brothers in the Ross family. All went to the War. One was killed with the Australian forces. Sir Ross Smith was with General Salmond in his flight from Cairo to Calcutta. After referring in detail to the stages of the great flight, the chairman said the brothers landed within half a mile of their own home, where their father and mother awaited them. Honour was due to those who had designed the Vickers-Vimy machine in which the journey was made, and to the makers of the Rolls-Royce engines. Never once did the plucky aviators have to turn back on account of faulty mechanism. All who cared for the position of England in the air would welcome them. The British Empire would not allow the great science and art of aviation to languish, if only because of those who had already done so much for it.

Sir Ross Smith, in response, paid a generous tribute to the two mechanics who had accompanied him and his brother in their flight, and without whose aid, he said, they could never have accomplished the undertaking. A Rolls-Royce engine properly looked after would carry an aeroplane anywhere. With reference to the Vickers "Vimy" machine they used to say in Australia that if they had not got through they ought to have been jolly well kicked. It and the engines were the finest it was possible to have. They received great kindness and assistance from everyone at the R.A.F. aerodromes *en route*. They could not have found a better route for a joy-ride. He was sorry to see that commercial flying was not going ahead as it should be in this country. The depression, however, was merely temporary, and he was practically certain that in the future things would turn out as they had expected. It was the duty of all who flew to impress on the public the necessity of commercial air services. To a very great extent our future lay in the air. Perhaps in Australia the necessity of flying was felt more than here. If they could establish regular air services, not only between Great Britain and Australia but between Great Britain and all other parts of the Empire, that would be a means of binding the Empire together, and that was what was wanted. The message they received from the King after the flight said: "Your success has brought Australia nearer to the Motherland." If they had done that they were more than repaid for anything they had done.

Sir Keith Smith echoed all the expressions of appreciation of his brother, and also emphasised the value of their mechanics. One thing, he said, that kept them going was that they were flying home to their parents.

General Brancker, proposing the health of the Chairman, said that General Seely was the only statesman who really believed in aviation and was prepared to stake his future on it. He was absolutely convinced that the future of the British Empire was in the air, even as its past was with the Navy, and it was, therefore, the duty of every man, woman, and child to do what they could to forward aviation.

On Thursday, February 24, at the Connaught Rooms, Sir Ross and Sir Keith Smith were the guests of the Imperial Air Fleet Committee, Lord Desborough, the President, occupying the Chair. Amongst those present were:—Sir Joseph Ward (New Zealand), Lord Morris, Sir Peter McBride (Agent-General for Victoria), Sir T. A. Coghlan (Agent

General for New South Wales), Sir Edgar Bowring (High Commissioner for Newfoundland), Lieutenant-Colonel W. D. Beatly (Air Ministry), Sir John Cockburn, Sir Edward Lucas (Agent-General for South Australia), Lieutenant-Colonel G. Helbert (Military Staff Officer of High Commissioner for South Africa), Colonel E. C. Complin (Officer Commanding Canadian Military Detachment in United Kingdom), Mr. M. L. Moss, K.C. (Acting Agent-General for Western Australia) Mr. McEwan Hunter (Agent-General for Queensland), Mr. A. H. Ashbolt (Agent-General for Tasmania), Sir Quinton Brand, Air-Commodore E. M. Maitland, D.S.O., Captains Cockerell and Broome (pilots of *The Times* Vickers-Vimy flight to Tabora), Major W. A. Coates (Liaison Air Officer for Australia), Squadron-Leader P. R. Meredith (Liaison Air Officer for Canada), Mr. H. White Smith (President of the Society of Aircraft Constructors), and Mr. Alfred Docker (chairman of executive, I.A.F.C.).

Lord Desborough, in proposing the health of the guests, said the committee had a certain claim to gratitude as being the first society to try to influence British opinion on the necessity for flying. Before the War and during the War they had continued their work by presenting aeroplanes to the Dominions. Sir Ross and his brother, he said, had brought Australia within 135 hours of the mother country. After a review of the notable war services of the aviators they had met to honour, Lord Desborough read a letter he had received from Lord Weir, in which he regretted his inability to return to London from France to meet Sir Ross and Sir Keith Smith, and asked that his profound congratulations on their wonderful flight be conveyed to them.

It is the recollection that we possess pilots, navigators, machines, and engines capable of such enlightening performances (Lord Weir wrote) which renders the present position of British civil aviation so perplexing and disappointing. Naturally, at a time like this, when the whole industrial and financial position is in such a parlous situation, it is rather hopeless to expect enthusiasm and enterprise to be devoted to novel developments, but if the commercial developments be temporarily arrested we simply cannot afford to risk any stoppage in technical progress, and money must be found to continue the wonderful work done by our British pioneers. This commemoration luncheon to two Imperial air pioneers will serve to arouse public feeling and recall the supreme position we achieved in opening up the world's longest air-way.

The Chairman, at the conclusion of his speech, presented Sir Ross and his brother with a hand-worked Australian flag in commemoration of their great flight, and a similarly-worked South African flag was presented to Flight-Lieut. Sir C. J. Quinton Brand, K.B.E., D.S.O., D.F.C., M.C., the colleague of Colonel Sir H. H. Van Ryneveld in the flight from England, *via* Cairo, to the Cape.

Sir Ross Smith, who, like his brother, was given a most enthusiastic reception, mentioned several circumstances and conditions which had made the flight to Australia possible. In the first place, he repeated his eulogies of the machine and engines. The Vickers-Vimy machine and the Rolls-Royce engines needed no further praise, he said. They were also fortunate in having their petrol arrangements entrusted to the hands of the Shell Company, who, at the shortest notice, managed to put down supplies at all the out-of-the-way places at which they landed. The same praise, he said, was also due to Wakefield's Castrol Oil, which served them in such good stead. He believed that the route which it was their privilege to be the first to go over would be very speedily developed. When they arrived in Australia they found that a certain amount of commercial flying was being done there, and already mails and goods were now being conveyed by aeroplane. With its vast open spaces and excellent weather conditions Australia was the best country in the world for commercial flying, and before very long they would see a regular aeroplane service in operation. The aeroplane was the surest means of knitting the Empire together. Aerial transport was the quickest and in his view the safest. Statistics of accidents seemed to show that it was more dangerous to walk across the street than it was to ascend in an aeroplane. The only way to help the cause of aviation was to impress upon the public the necessity for it.

Sir Keith Smith devoted a short speech chiefly to praise of the two mechanics who accompanied them on their flight. No matter how excellent the machine and engines, he said, the least slovenliness in overhaul would be bound to prove fatal sooner or later on a long flight. Although, from the number of accessories they carried, the mechanics were cramped for room and often at the end of a long stage were hungry, no sooner did they touch ground than they had their coats off and began work on the engines to ensure their readiness for the next day. The peoples they came in touch with on the journey, the Dutch, Siamese, and Burmese, were all anxious to be helpful, and the Dutch in particular wished it to be known to the people in Australia that if an air route to Australia were established they would do everything in their power to make it a commercial proposition.

Sir Joseph Ward remarked upon the unique character of the occasion, where they had two brothers, two knights, who had achieved the first flight between England and Australia, receiving the congratulations of the King on their marvellous performance. They had determined to establish a great air service on commercial lines for both Australia and New Zealand, and he hoped that Sir Ross Smith would be in charge of the one and Sir Keith Smith in charge of the other. To the magnificent enterprise of Lord Desborough, to his energy of character and force of personality, British aviation owed a very great deal.

During the lunch a telegram was received from the King in response to a message of loyal greeting which the committee had sent to His Majesty on behalf of themselves and the representatives of Imperial aviation and of the Dominions, who were their guests at the luncheon. The telegram was as follows :—

> "I am commanded to convey to you, the president and members of the Imperial Air Fleet Committee, and to your guests, the best thanks of the King for your kind message of loyal greetings to His Majesty as Air Chief on the occasion of the celebration of Sir Ross and Sir Keith Smith's great achievement. His Majesty is in hearty sympathy with you all in doing honour to these distinguished aviators.—STAMFORDHAM."

On Tuesday, February 22, Sir Ross Smith and his brother, Sir Keith Smith, paid a visit to the Weybridge works of Messrs. Vickers, Ltd., where the Vickers "Vimy-Rolls" machine used in their famous flight was built. The brothers received an enthusiastic welcome from the staff, and Sir Ross Smith said that most of the credit had been given to them, which was altogether wrong. If it had not been for the excellent design and workmanship of the machine they could never have got through. The brothers then inspected the Vickers "Viking" Amphibian and the new air ambulance which is now nearing completion.

Sir Ross Smith and Sir Keith Smith will be entertained at luncheon at the Hotel Cecil today (Thursday), March 3, by Messrs. Rolls-Royce, Limited, Messrs. Shell-Mex, Limited, Messrs. C. C. Wakefield and Co., Limited, and Messrs Vickers, Limited, in celebration of their historic flight from England to Australia.

At the luncheon Sir Frederick Sykes, Controller-General of Civil Aviation, will present Air Force Crosses to Captains Cockerell and Broome and Air Force Medals to Messrs. Corby and Wyatt, in connection with *The Times* African flight. The conferring of these awards was announced last July. In addition, he will present some personal gifts to Sir Ross Smith and Sir Keith Smith in commemoration of their flight.

On March 4, Sir Ross and Sir Keith Smith will be entertained at a dinner at the First Avenue Hotel, arranged by the London branch of the Australian Natives' Association. Particulars and tickets may be obtained from the Hon. Secretary, c/o the "British Australasian," 51, High Holborn, W.C. 1.



Alighting Tests on the Thames

THE Air Ministry has arranged to carry out further alighting tests on the Thames in order to ascertain whether varying conditions of tide and weather introduce any unforeseen difficulties in the use by aircraft of the selected area of the river between the Westminster and Albert Bridges.

These tests will be carried out by the Air Ministry's "Vickers-Viking–Napier-Lion" Amphibian G-E.A.U.K., which won the first prize in the Air Ministry's Competitions for Amphibians, and which carried out the previous test.

After alighting the machine will, according to the state of the tide, either pick up temporary moorings, or go ashore on the hard adjacent to the Doulton Pottery Works, afterwards taking off and returning to its aerodrome.

The tests, which were to have taken place this week, provided the weather was suitable for the purpose, on February 28, March 1, 2, 3 and 4, have been temporarily postponed, possibly until next week.

AIR TRANSPORT AND EFFICIENCY

Two Interesting Papers Read at Olympia

AT the *Daily Mail* Efficiency Exhibition, which closed on Saturday of last week, it was only natural that the question of air transport should receive attention, making as it does for greater efficiency in intercommunication between countries. On Friday, February 25, two very interesting papers were read in the Conference Hall at Olympia, Major Sir J. L. Baird, Bart., C.M.G., D.S.O., M.P., being in the Chair. The first paper, read by Mr. H. White Smith, C.B.E., was entitled "Aeroplane and Seaplane Efficiency," and this was followed by a paper by Mr. C. I. R. Campbell, O.B.E., M.I.N.A., headed "Airship Transport." Following are extracts from the two papers :—

"Aeroplane and Seaplane Efficiency"

When considering aerial transport in relation to or in comparison with other forms of transport it is useful to consider in the first place of what efficiency in transport consists. We find that the most efficient form of transport is a combination of the following qualities :—(1) Speed, combined with a capacity for covering distance. (2) The ability to convey merchandise, mails or passengers from one point to another without constant handling or changing. (3) Mobility. (4) Safety and reliability. (5) Economy of working, producing the lowest possible price for the amount of service rendered.

Given these qualities as being those necessary for efficient transport services, I think we may with safety say that the aeroplane gives the greatest promise of efficiency of all modern transport.

Let us examine these points in the order in which I have stated them :—

Speed

As far as speed is concerned, the aeroplane—and I use this term in a generic sense, including the amphibian and seaplane—has an outstanding advantage over other forms of transport. At the present stage of development we do not think of aerial transport except in terms of 100 m.p.h. By this I mean what is termed cruising speed, and not the full speed of the aircraft, which approximates to 125 m.p.h. For the time being the speed of 100 m.p.h. is probably the most economical to adopt, but there is no reason why, in the future, we should not employ cruising speeds of 130 m.p.h. with top speeds of 160 to 180 m.p.h.

No other form of transport can in any measure approach these startling speeds. To enable you to appreciate the advantage in speed which the aeroplane has over other modes of transport I have prepared a short table showing the times taken by the express train and boat to reach the principal towns in Europe, and also the time in which the aeroplane could complete the journey. The aeroplane times are based on an average flying speed of 100 miles per hour, allowing half-an-hour's delay to change machines at each stopping place.

London to	Distance in Miles	By Express Train and Boat	By Air Day Flying 12-hour day	Saving in Time
		(hours)	(hours)	
Paris	240	9	2¼	6¾
Marseilles ..	700	22	8	14
Brussels ..	210	10	2	8
Amsterdam ..	260	13½	2½	11
Hamburg ..	410	25	5½	19½
Copenhagen ..	560	47	7½	39½
Berlin ..	560	25	7½	17½
Prague ..	700	36	9	27
Madrid ..	950	44	11½	32½
Rome* ..	1,150	43	26½	16½

N.B.—The times taken by train and boat are the approximate times taken by existing express services.

The air routes shown are all practical, and in fact those to Paris, Brussels, Amsterdam, Hamburg, Berlin, Copenhagen, and Prague should be in operation this year either by British or foreign aerial transport companies.

On comparatively short distances, such as to Paris, Brussels, and Amsterdam, there is no difficulty in travelling from point to point in a few hours, but to some of the places, such as Marseilles, Hamburg, Berlin, Copenhagen, the distance could also be covered for certainly nine months of the year in the day. For the greater distances, such as Rome, Bucharest, under present conditions a stop would have to be made when darkness fell and a start made at daybreak next day, with a consequent loss of much time and efficiency of service. If night flying is developed on right lines the efficiency and possibilities of aeroplane services will be vastly improved, but even on the figures of daylight flying only it will be seen that in the conveyance of merchandise of a light character, of mail matter and documents and newspapers, the saving of time by aircraft is so considerable as to, in all cases, justify the use of this mode of transport. I think you will agree, therefore, that, judged on speed alone, the aeroplane is the most efficient mode of transport.

* If flying by night, 13½ hours.

2. *The ability to Convey Merchandise, Mails, or Passengers from one point to another without Constant Handling or Changing*

It is obvious the less handling there is on any consignment of goods the more you reduce handling charges, combined with the more rapid movement of a greater amount of goods ; therefore any form of transport which reduces handling is making for efficiency. The aeroplane here scores a considerable advantage over other forms of transit. Take a parcel being sent from London to Paris. First of all it is placed in the van, from the van it is moved into the train, from the train to the boat, from the boat to the train again, then to another van, then to its destination. By air the parcel would be placed in the van, then into the aeroplane, and again into a van and to the destination, a saving of at least two handlings. To business houses whose goods are at all liable to damage the reduction of handling will be apparent, as it means less liability to damage, fewer charges for handling and greater safety.

Another feature which is of real importance at the present time is the almost complete elimination of the risk of pilferage. This advantage of the air is apparent, and I may here mention that the rate of insurance against all risks for a parcel despatched by air is anything from one-third to one-sixth of the rate when sent by land and sea. It may be objected that, on the longer routes, such as to Rome and Madrid, the relay system of aircraft would be operated, and that there would be a consequent transference of the goods and passengers at various stages of the journey ; but even so, these stages would be of considerable length, probably not less than 400 miles, with consequently infrequent changes, and part of the standard equipment of goods-carrying aircraft would be a type of specially made "containers" which would be rapidly transferred from one aeroplane to another ; the handling would be in bulk and the risk of pilferage from these sealed containers practically nil.

3. *Mobility*

Another important asset of the aeroplane is its mobility. The only factor controlling mobility is the necessity of using aerodromes for departure and landing. The operators of aircraft can, however, place their landing grounds at any desired point to serve great centres of population, or with equal facility, the small village.

The value of this quality of mobility will be most apparent, however, in our great Dominions and Colonies and the other countries of wide distances. In the Colonies you have no such network of railways or roads as exist in Great Britain and Europe. There are great open spaces untracked by rail or roads, and it is in these places that the mobility of the aeroplane will prove of the greatest service. In these places the land for aerodromes will be cheap and they will be easy of construction.

In reviewing this question of mobility the development of the amphibian calls for our careful consideration, for operating as it does on either sea or land, there is a great advantage as regards the place of its departure or landing. If land aerodromes are not available, probably the sea or river would be available, and its mobility is therefore correspondingly greater. In this connection the alighting experiments which have recently taken place on the Thames between Westminster and Albert Bridges are of the greatest interest.

Safety and Reliability

The next question we have to consider in relation to efficiency of transport is that of safety, and, linked with it, reliability. Although there is but a short history and experience behind the development of aerial transport, it has already an excellent record for safety and reliability. While accidents do happen to aircraft, and some of them

serious, yet the record of commercial flying is surprisingly good. For 17 months up to September, per 1,000 people carried last year, the percentage of fatal accidents for aircraft was .08, or one in 12,500, and the injuries .15, or one in 6,500 people.

The chief difficulty to be solved is that of fog; air navigation instruments and wireless telephones are being developed, and directional wireless improved, permitting of the navigation of aircraft out of sight of landmarks and guides, equally well above the clouds or in a fog; engines are being proved and developed for commercial work; stability is being studied, so that there will be a steady progress in safety and also in reliability of aerial services.

5. *Economy of Working. Lowest Possible Price for the amount of Service Rendered*

We next come to the very important question of the cost of operation and its effect on efficiency in transport.

As regards economy of working in the air, the war experience was purely retrograde, and so far from helping to develop economy, that quality had to be completely disregarded, and the first and only consideration was necessarily efficiency in air fighting. We still have hardly shaken off this war influence, but with the past two years there has been a steady improvement in the design of commercial aircraft, productive of economy. For instance, in the paper which I read before the Air Conference you will see, on reference to the detailed statements of costs, which I then presented, that war machines such as the Airco 9 and the "Bristol" Fighter cost to operate per ton mile about 8*s*., whereas today there are machines available, such as the Airco 18, the Handley Page W.8, and the "Bristol" 10-seater, by which the cost has been reduced to about 3*s*. 6*d*., that is, less than half.

In considering the question of economy in operation we must have regard to the effect of speed. In all forms of transport there are speeds which are economical, and any increase on these speeds means increase in cost of operation. The same applies in the air. The economical air figure is the high one to which I have already referred of about 100 m.p.h.

To examine the comparative cost of transport by air, land and sea, I have set out a short table which shows what it will cost to transport a ton of cargo on two journeys, one short, London to Paris (240 miles), the other longer, London to Marseilles (700 miles). I have also shown the cost per passenger and the time occupied by the various modes of transport.

London to Paris, 240 Miles

Method of Transit	Goods		Passengers	
	Time	Cost per Cwt.	Time	Cost
Train and boat ..	—	—	9 hrs.	£3 16*s*.
Do. Grand Vitesse ..	4 days	11*s*. 9*d*.	—	—
Do. Petit Vitesse ..	10 days	6*s*. 9*d*.	—	—
Boat only	—	—	—	—
Motor transport ..	30 hrs.	25*s*.	—	—
Air transport	2½ hrs.	55*s*.	2¼ hrs.	£6 10*s*.

London to Marseilles, 700 Miles

Train and boat ..	—	—	22 hrs.	£7 2*s*.
Do. Grand Vitesse ..	8 days	17*s*. 6*d*.	—	—
Do. Petit Vitesse ..	14 days	9*s*. 9*d*.	—	—
Boat only	10 days	4*s*. 6*d*.	10 days	£22 0*s*.
Motor transport ..	5 days	52*s*. 6*d*.	—	—
Air transport	8 hrs.	157*s*.	8 hrs.	£17 0*s*.

At a first glance it will be said that the cost of air transport is high, but you must consider cost in relation to the time occupied. That is, in the case of passengers, time is money, and the business man has so much time saved to devote to other business activities; incidentally he reduces his expenses for hotels, meals, etc., by means of the shorter time used for a journey.

It is important to bear in mind that whereas the older forms of transport have reached a point at which very little reduction in cost of operation is possible, we are only at the beginning with aircraft, and it should be possible to effect a gradual reduction. Take one item alone, the chief item, the cost of running aircraft, that is the bill for petrol. This represents approximately one-third of the total running cost. Every penny reduction per gallon in the price of petrol, or every point that can be saved by improvement of engine or aircraft design, will help towards reducing this very expensive item.

The City and Aerial Transport

I have addressed my remarks to the business man with the object of trying to show him that the air is an efficient mode of transport—if not at present the most efficient, and that it is to his advantage to use. I do not suggest that aerial transport will displace other forms of transport. Generally speaking, the newer forms of communication have not displaced the old, but have become additional and complementary to them, and I think this will be so with the development of aerial transport.

The business men in my audience may say: "Yes, we agree with all that you are saying: aerial transport has distinct advantages over other forms of transport, and we should like to use it. How can we do so?" This brings us to the present-day position of British aerial transport, which, I must frankly say, is regrettably unsatisfactory. What is the present position? During the summer of last year it really appeared that aerial transport was getting firmly on its feet and that British aviation was leading the world.

The firms who commenced operations immediately after the war and have been courageously carrying on up to the end of last year have had, with one exception, to drop out of the business. The financial reasons for their so doing arose mainly from matters other than were connected with the carrying on of the aerial transport business. Last year two British companies carried on a regular service to and from Holland, and British material and pilots were exclusively employed. This year, so far as is known, no British company will operate the service to Holland, but it will be carried out by a Dutch company using Dutch-built Fokker aeroplanes.

Difficulty of Raising Capital

The difficulty today is that of finding capital; to find companies or people who will take a long enough view of the matter, and who can, and are prepared to finance the operation of the services. The Government has, very late in the day, promised to subsidise up to a total of £60,000 for this year, but, while this would materially assist if firms were actually operating, it is essential that capital be found to purchase the up-to-date commercial aeroplanes, which are necessary, and the designs of which are now ready for production, to run the services efficiently and economically and on a profit earning basis. In this connection, on behalf of the Society of British Aircraft Constructors, of which I have the honour to be Chairman, I have submitted a proposal to the Air Ministry that the Government should come forward at this juncture and place orders with our constructing firms for up-to-date commercial aircraft and engines, and that these aircraft should be hired out to the operating companies on a basis to be agreed. The operating companies would naturally be responsible for the full insurance of the aircraft, and the hire payments would no doubt give such a return to the Government as to protect them against loss on the transaction.

In addition to this, the Government could have a call on these machines for military purposes. Another advantage of such a step at this time, when unemployment is so widespread and the aircraft industry and its workers are so needful of support, is that it would create employment for a considerable number of workers not only in the construction of the aircraft but in the supply of the materials and components by other trades. This proposition appears to me to be practical and at the same time far better than paying doles to unemployed, and also gives promise of placing aerial transport on a sound basis. Such a constructive step should be handled boldly; that is, enough machines should be purchased to enable British transport companies to enter afresh on the London-Paris and London-Brussels services, and also to open up the air routes to Copenhagen, Berlin, Marseilles and Madrid. If, say, 100 aircraft were ordered from several constructors at a cost of, say, £650,000, a large sum by way of wages will radiate through a number of trades, and a bold bid would be made for the maintenance of our supremacy in the European airways.

I would strongly urge that it is time that not only the Government, but the man with shipping interests, bankers, merchants and manufacturers should get down to this question of aerial transport and see whether there is not good ground for their taking an active interest in it, not only from the point of view of the user, but from the point of view of the capitalist who is prepared to assist in its development.

Commercial Aviation and National Defence

There is an important national aspect to this question of commercial aviation which deserves the consideration of the British public and the Government. In times of peace it is obvious that we, as a nation, cannot afford more than a comparatively small standing Air Force. It follows, therefore, that the only way in which we may have a reserve of air power is by the creation of commercial air fleets.

A most important feature of maintaining a strong mercantile air fleet is the demands that will be made on our constructors for the design and supply of aircraft which can be continually tried out by practical operation, and concurrently a steady development of the power of aircraft production, combined

with the building-up of a great industry employing large numbers of workers, will be maintained in this country. We are all for economy, but it is false economy to neglect the development of a form of national defence which can be run on business lines, and this neglect may involve us some day in suddenly spending vast sums of money on the extension of our military and naval Air Force.

"Airship Transport"

In the following paper it is proposed to deal only with rigid airships, because this type is the most efficient in the larger sizes which will chiefly be used for airship transport.

Safety and Reliability

The airship derives her support when in flight not from her speed, but entirely from the buoyancy of the surrounding air. Provided her gasbags retain their bulk of hydrogen, there is no possibility of the ship coming down through accidental lack of buoyancy. The possibility of forced descent being made through accident to the gasbags, with a consequent loss of gas, has been provided against by limiting the size of the individual gasbags. Any one gasbag can be deflated without causing an accident to the ship—this is analogous to the watertight subdivisions of seagoing ships.

The possibility of machinery failure has, of course, not the same significance in an airship as in an aeroplane or seaplane, because the airship will remain aloft and give opportunity for machinery repairs to be carried out. We have, therefore, in airships a degree of safety and reliability in flight which is more analogous to that obtained in land transport than with that usually associated with the air.

It is often urged against airships that there is a considerable risk of fire. Our experience shows, however, that this is not the case; and, if it were, additional safeguards could be introduced at no very excessive cost which would effect the desired result.

Comfort

We now come to the question of comfort for passengers. It will soon be possible for all those interested to evaluate this by actual experience. We are completing at Messrs. Beardmore's aerodrome, "R. 36," which is being fitted with a passenger car suited for 50 passengers. The car is 9 ft. wide on the floor, with the sides sloping outwards and upwards so as to give increased width towards the top. The length of the car allotted for the beds and seats of the passengers is 84 ft., and, in addition, there is an ample provision of lavatories, a large galley, and so forth, which brings the total length of the part of the car allotted to passenger use up to 130 ft. Each passenger has a separate bed isolated by curtains, which folds away during the day; he is also provided with an easy chair and a half-share in a table, etc. Meals will be served exactly as in a railway restaurant car, and smoking will be permitted. The standard of comfort appears to be all that can be required on voyages of, say, two days in duration, but no doubt we shall be able to improve upon it in subsequent designs.

Performance

Rigid airships have hitherto been built entirely for service purposes, and for such airships we have plenty of data from actually completed airships to enable us to make accurate estimates of performance up to sizes of about 75 tons total lift. For sizes larger than that we have "R. 38," now completing at Bedford, and designs have been studied both in this country and Germany for airships up to at least 120 tons total lift.

I understand that airships of 60-90 tons total lift are likely to be used in the first instance, and if we allow 15 per cent. of the total lift to be devoted to commercial load, *i.e.*, passengers and cargo, we shall have from 9-13½ tons so employed. In order to estimate the number of passengers which can be carried, we can proceed as follows:—"R.36" has given us reliable data as to the weight of passenger accommodation, *i.e.*, car and her equipment, including such items as linen, crockery, etc. Taking the usual average weight of each passenger, and allowing 70 lbs. each for luggage, we find that we can carry about 5½ passengers for each ton devoted to them, their luggage, and their accommodation. In considering the endurance of the ship, we must take account of the food, drinks, and washing water required for passengers. We must take into account that appetites aboard an airship are very good, and that we can be sure there will be no seasickness, which is quite unknown in large airships. On the other hand, the life is a very clean one in the perfectly pure air 2,000 ft. up; so we need not allow quite as much as usual for washing water. On the whole, it is thought that if we allow 22½ lbs. a day per passenger for food, drinks, and water, we shall make ample provision; and we may say, roughly, that 100 passengers will consume 1 ton per day throughout the voyage. We are now in a position to estimate the endurance of a passenger-carrying airship, and this has been done for a ship equal in size to "R. 38," *i.e.*, 83 tons total lift, and for a ship of 120 tons total lift, and the results are shown in the following table:—

Ship.	Total lift (tons)	Commercial load = 15 per cent. total tons.	No. of passengers	Weight of cargo (tons)	Max. B.H.P.	B.H.P. at 60 m.p.h.	Petrol and oil carried (tons)	Endurance in miles at 60 m.p.h.	Length of voyage (miles)
R. 33*	59·5	8·93	—	—	1375	1150	6·5	1270	740
R. 36*	63·8	9·57	—	—	1400	1200	11·6	2020	1190
R. 38*	82·7	12·41	—	—	2100	1320	23·0	4250	2480
Commercial									
R. 38†	82·7	12·41	46	4·1	1980	1380	24·4	4250	2500
R. X.†	120	18	66	6·0	2620	1730	40·7	5300	3100

* No passenger car. † Passenger car fitted.

As far as "R. 38" is concerned, we can say that the results are not in any way speculative: they are based upon definite knowledge of what has already been done by airships very little less in size, and upon our experience in building "R. 38," and we can guarantee to achieve them.

The endurance of an airship is the distance she travels through the air, and is greater than the actual distance made good over the ground, because a reserve of fuel must always be carried to provide for the possibility of meeting adverse winds. We have, therefore, assumed that on an average voyage she may have to contend with an average adverse wind of 25 miles per hour. The allowances made above may be found excessive, but for the present they form a good basis for our estimates, and have been used in determining the length of voyage shown in the table.

The air speed assumed is 60 miles per hour, as this is suited for making use of one of the distinguishing features of airships, viz., their extraordinarily high endurance. The continuous speed adopted throughout this paper corresponds to two-thirds of the full power of the engines, so that the full speed of this airship would be about 68 miles per hour.

The speeds assumed for airships in most of the discussions which have taken place have all been somewhat low, but it is worth while to show that, if we ever wish to use airships on short-distance services of, say, under 1,000 miles, we can use much higher speeds. The following table has, therefore, been prepared:—

"R.38." Total lift = 82·7 tons

Maximum h.p.	1386	2205	3310	4683	6440
Maximum speed (m.p.h.)	60	70	80	80	100
Normal h.p.	924	1470	2205	3120	4284
Normal speed (m.p.h.)	52·5	61·2	70	78·6	87·4
Total dead weight (tons) (including ballast and crew)	39·8	43·8	49·2	56·0	64·5
Weight of passengers and cargo (tons) = (15 per cent. total lift)	12·4	12·4	12·4	12·4	12·4
Lift available for fuel, fresh water and food (tons)	29·5	25·7	20·4	13·8	5·6
Fuel, food and water consumption (tons per hour)	·242	·371	·546	·762	1·039
Endurance (hours)	122	69·5	37·4	18	5·37
Distance flown through the air (miles)	6400	4250	2620	1420	469
Length of voyage against a 25 m.p.h. wind (miles)	3360	2520	1685	965	335

"R. X." Total lift = 120 tons.

Maximum h.p.	1,820	2,890	4,305	6,130	8,130
Maximum speed (m.p.h.)	60	70	80	90	100
Normal h.p.	1,210	1,930	2,860	4,080	5,640
Normal speed (m.p.h.)	52·5	61·2	70	78·6	87·4
Total dead weight (tons) (including ballast and crew)	55	60	66·7	75·2	86
Weight of passengers and cargo (tons) = (15 per cent. total lift)	18	18	18	18	18
Lift available for fuel, food and fresh water (tons)	45·6	40·8	34·2	26	15
Fuel, food and water consumption (tons per hour)	·319	·498	·717	·999	1·358
Endurance (hours)	143	82	48	26	11·3
Length of voyage through the air (miles)	7,500	5,000	3,360	2,040	985
Length of voyage against a 25 m.p.h. wind (miles)	3,940	2,960	2,160	1,380	590

From this table it will be seen that, for distances of 1,000 miles, airships of the "R.38" type, but with more powerful machinery, can be run at a speed of 77 miles per hour while carrying 15 per cent. commercial load; and that similarly, for 335 miles, her speed can be 87 miles per hour. These speeds do not compare unfavourably with speeds commonly

used by some of the aeroplanes running between London and Paris.

It is not generally realised to what characteristic airships owe their relatively large endurance, and the following table has therefore been prepared, comparing the two types on a basis of total lift in lbs. per h.p., this criterion being one which is commonly in use for heavier-than-air craft.

Table showing variation of $\frac{\text{Total lift (lbs.)}}{\text{Normal h.p.}}$ with speed.

Normal speed (m.p.h.) ..	52·5	61·2	70	78·6	87·4
R.38	211	132·5	88·2	62·4	45·4
R.X.	233	147	97·5	68·2	50·4

Cost

The cost of running an airship service has been very fully and carefully worked out, and the results were given by Air-Commodore Maitland in a paper which he read before the Royal Society of Arts in April, 1920. This may be summarised as follows :—

Item	Estimated Cost £
One commercial airship, " R.38 " type ..	200,000
Base, comprising two-berth shed, a mooring mast, gas plant, repair facilities, etc. ..	575,000
Base, comprising one mooring mast and gas plant	45,000
Annual cost of operation of one airship, flying 2,000 hours at 60 m.p.h.	131,937
Annual cost of operating base with shed, mooring mast, etc.	116,700
Annual cost of base with mooring mast ..	12,000

Air-Commodore Maitland applies these figures to the cost of a service of four airships maintaining a weekly service each way between England and India *via* Cairo, and having a base with shed, etc., as above at Cairo and England, while the Indian base would be at Karachi, and would have a mooring mast and gas plant, but no shed. From these figures the all-in cost of running the service works out at 41*s.* 5*d.* per mile flown over the ground, and the particulars of cost and length of voyage are as shown on the following table :—

England to	Airship		Steamer	
	Approximate time of Transit	Mails (1 ton carried)	Passengers	Approximate 1st Class Steamer Passenger Fare
Egypt ..	2 days	6*d.* oz.	£50	£45 to £50
India ..	4½ ,,	1*s.* ,,	£100	£65 to £70
S. Africa ..	6 ,,	1*s.* 3*d.* ,,	£120	£70
Australia ..	9½ ,,	2*s.* ,,	£190	£115 to £128

My own view of these figures is that while the cost of an airship of " R. 38's " size cannot yet be reduced so low as the £200,000 quoted by Air-Commodore Maitland, it certainly will be possible to do so in the future. On the other hand, the figures given for the cost of many other items can, it is thought, be substantially reduced without imprudence. These figures show, I think, that the cost of airship transport is not in any way excessive, having regard to the enormous advantages which it confers.

Attention at the present time is concentrated to getting airship services started, and as at the start they must be limited in extent, the cost works out at a far higher figure than corresponds to any established condition of working. When, for instance, we have air bases with two or three airship services worked from each, and with aeroplane services as well, possibly acting as distributors and collectors for the airship passengers and freight, we shall easily reach competitive prices for transport. Further, as the services develop, we shall be able to use larger and larger airships with a considerable reduction in cost per unit of load.

Mooring and Handling Arrangements

All that has been said above as to performance refers to airships in flight, but no doubt many of you are thinking that the greatest difficulty hitherto has been in connection with the handling of airships on the ground. This is perfectly true, and I will now deal with this important matter.

In airships, the inherent defect is great bulk, or rather the difficulty of controlling that great bulk when close to the ground, in a strong wind. We cannot yet follow the inventor who proposed an enormous airship, which would never come within several thousand feet of the ground. We can, however, arrange that our airships do not actually come to the ground at all in the normal course of their regular services, but that at each of their terminal ports they will be moored to masts from 100-200 ft. high, according to the size of the airship. The process of mooring a ship to a mast is one that requires quite a small landing party of perhaps a dozen men instead of the large numbers required for handling a ship on the ground, and enormous economy thereby results, quite apart from the fact that it does eliminate all difficulty in regard to handling airships in bad weather.

We have now considered the commercial capabilities of airships, and little imagination is required to realise the direct benefit to humanity which airship services will confer. It is, however, worth while to note the special advantages which the British Empire in particular would derive from them. At present we are able to hold a conference attended by all the Imperial Premiers once only in three years, owing to the lengthy absences from home involved for some of the members, as a result of the time occupied in travelling. These conferences are of the greatest importance to the cause of Imperial unity, and airship services will enable them to be held at least once a year without inconvenience to any of the members, and we should then, for the first time, have a real Imperial unity. Again, the Government of India will be greatly simplified when it is possible to send full despatches and even messengers from India to this country in less than a week by airship.

It is evident that the international character of such long-distance services involves that the choice of airships will also be international, *i.e.*, the airships used will be obtained from whatever country is best able to build them. Our own experience shows that a considerable time is required to start effectively the construction of airships in any country. By the fortune of war and with heavy expenditure of money and effort we have secured a very promising position among the nations in this matter, and we have now available the works and the trained personnel. It is of the greatest importance that we should hold this position, so that when the real commercial development of airships begins we may be in a position to reap full advantage of it, to run our own airships upon the principal air routes, and to build airships for all the world.

Sir Frederick Sykes in Belgium

AT the Belgian Aero Club on February 24 a dinner was given in Sir Frederick's honour, prior to his lecture on the progress of aviation in Great Britain during the War and in peace. Among those present were the British Ambassador, Sir George Grahame; M. Devèze, Belgian Minister of National Defence; General Pérot, French Military Attaché here; and the military attachés of all the nations represented in Brussels. The President of the Aero Club proposed the health of the British Ambassador and General Sykes, and in reply Sir G. Grahame recalled the heroic part played by Belgium, and particularly by Belgian aviators, in the War. He made a special allusion to the bravery displayed by King Albert in flying on several occasions over the enemy's lines " on the wings of the eagle of battle." It was in the honour of these acts of courage, the Ambassador said, that the Duke of York was coming to present to His Majesty, in the name of King George, the Distinguished Flying Cross.

General Sir F. H. Sykes spoke in the warmest terms of the services rendered by Belgian aviators to the Allied armies during the War. He was glad to see that Anglo-Belgian friendship was becoming more cordial every day. Now that the War was over, he added, it was necessary to develop civil aviation as an important factor in economic progress. In conclusion, he alluded to services which might be rendered by Belgian and British aviation in the development of Belgium's African colony, particularly in regard to aerial communications between Cape Town and Cairo by way of the Belgian Congo.

" R.80 " Moves Her Quarters.

THE Vickers-built airship " R.80," under command of Capt. Little, left Valley airshed on February 24 for Howden aerodrome, where she will be stationed for a time. She passed over Barrow at a low altitude, and then headed on an easterly course, going at a good steady pace, the weather being fine. She was escorted by " R.32," and landed safely at Howden during the afternoon.

CAMBRIDGE UNIVERSITY AERONAUTICAL SOCIETY

(OFFICIAL ORGAN "FLIGHT")

ON February 9 a Paper was read by Mr. A. J. Rowledge entitled :—

The Napier "Lion" Aero Engine

In his introduction the lecturer stated the reasons and considerations which led to the "Lion" being designed as a "triple-four," with the central block vertical and the other two making an angle with it of 60 degrees. The short four-throw crankshaft particularly is a simple job, and although fairly light gives good rigidity. High compression was chosen because the requirements at the time of designing were an engine which would develop at least 300 h.p. at 10,000 ft. Mr. Rowledge then gave a brief description of the engine, but as a full detailed description was published in FLIGHT of March 27, 1919, we think it unnecessary to publish this part of his paper.

Performance.—The nominal h.p. of the engine is 450 at 2,000 r.p.m. The actual power is 480 b.h.p. at 2,000 r.p.m. and 510 h.p. at 2,200 r.p.m. These figures were attained with a fuel consisting of 20 per cent. benzole with Aviation spirit. The brake mean effective pressure exceeds 130 lbs./sq. in. In a recent Government test an engine ran for one hour, developing 530 b.h.p. at 2,210 r.p.m. and one hour at 490 b.h.p. at 2,025 r.p.m. Curves were then shown of petrol consumption, and the lecturer said that on long runs at rather high cruising power it had been found possible to attain a combined fuel and oil consumption of less than ·5 lb. per b.h.p. hour. The total swept volume of the engine is 1,461 cu. ins., and at 2,000 r.p.m. 1 h.p. is developed for every 3·03 cu. ins. An oil consumption curve showed the valuable characteristic that the consumption is high at high power, and low at low power, which results in practice in an extremely low oil consumption. The heat lost to the jackets less the heat directly radiated by the engine at normal revs. is approximately 9,500 B.T.U. per minute, and this amount has to be dissipated by the radiator. The rate of water flow from the engine is ·75 gallon per minute at this speed.

The weight of the engine with airscrew boss and hand-turning gear complete is 890 lbs. The weight of the complete installation, including exhaust pipes, propeller, radiator, water, cowling, the part of the aeroplane structure carrying the engine, fuel and oil tanks—in fact the whole weight of the power plant, less fuel and oil, in service, comes out at between 1,480 and 1,580 lbs., or 3·08 to 3·28 lbs./h.p. at normal revs. The fuel consumption depends very much on circumstances. In a passenger service, where speed is essential, the consumption in practice is between 20 and 25 gallons per hour. This obtains with a machine weighing 6,730 lbs. and flying at 100 m.p.h. At Martlesham the petrol consumption of one of these engines was 14·2 gallons per hour, the machine weighing 4,900 lbs. and cruising at 82 m.p.h. The fuel consumption for racing purposes might be over 30 gallons per hour. These figures also hold with the low compression engine. For commercial work with machines weighing 15 lbs./h.p. and flying mostly at low altitudes, the low compression engines give better service and nearly the same performance. The maximum b.h.p. of the low compression engine is about 7 per cent. less and the h.p. at climbing speeds 5 per cent. less than that developed by the high compression engines.

The influence of weight/b.h.p.—This is an important matter as regards cost of a commercial service. Assume that the flying qualities of the machine vary as the weight per b.h.p. The structure weight of an aeroplane is a definite proportion of the total flying weight. Let A = total weight of power unit with fuel, B = total weight of structure, C = useful load, W = total flying weight, a = weight of power plant per b.h.p., b = structure weight per b.h.p., c = useful load per b.h.p., and w = total flying weight per b.h.p.

Then $A + B + C = W$
and $a + b + c = w$.

Taking the D.H. 18, the figures become :—

$A + B + C = 2{,}414 + 2{,}850 + 1{,}470 = 6{,}730$;
or $a + b + c = w = 5{\cdot}36 + 6{\cdot}33 + 3{\cdot}26 = 14{\cdot}95$.

If the weight of the power plant be increased by ½ lb./b.h.p. the useful load must be decreased by the same amount, and becomes 2·76 lb./b.h.p. To carry the same load, the total flying weight has to be increased over 18 per cent. and the b.h.p. by a similar amount. In a high-performance machine or one doing long journeys, this point becomes much more important.

Finally the lecturer called attention to some general considerations of small bulk to give low head resistance, and pointed out how the "Lion" scored owing to the disposition of the cylinders in W formation. He also showed slides of various installations of the "Lion," and lastly some slides of the new Napier "Cub."

THE ROYAL AERONAUTICAL SOCIETY

Lectures.—At the last meeting of the present session on March 17, Capt. D. Nicolson, M.I.N.A., Associate Fellow, will read a paper on "Flying Boat Construction."

Notices to Members.—Notices of the Annual General Meeting, which is to be held at 5 p.m. on Thursday, March 31, are now being posted to all voting members, and should be in their hands by Monday, the 28th, at the latest. Besides the notice a copy of the present Rules, together with the Council's proposed amendments, and a card of membership, are enclosed in each envelope. The Council's proposed regulations for the examination of candidates for Associate Fellowship will be sent with the Council Election ballot papers on or before March 21. The Council's Annual Report and Accounts will be found in the March issue of the Journal.

Manchester Association of Engineers.—At the request of the Manchester Association of Engineers, it has been arranged for the Chairman (Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C.) to read a paper on "Some Problems in the Design and Operation of Aircraft" before the members of that body at 7 p.m., on March 2.

Donations.—The Council desire to acknowledge with grateful thanks the gift of a set of lantern slides from Messrs. Vickers, Ltd., which will be added to the loan collection of the Society.

W. LOCKWOOD MARSH,
Secretary

Round Denmark

ON Saturday last, two Danish naval aeroplanes are reported to have made a complete flight, the first, round Denmark in 11 hours. The distance is about 600 miles.

INSTITUTION OF AERONAUTICAL ENGINEERS

Council Meetings.—The Council met on February 14, and February 21.

Elections.—Pilots : J. Whitworth Jones, F. H. Solomon. Associate : John Williamson.

General Meeting.—The General Meeting for the presentation of the Council's Report and Balance Sheet for the year 1920 will take place, at 8 p.m., at the Royal Society of Arts, on March 15.

Lecture.—The next lecture will take place at 8.30 p.m. at the Royal Society of Arts, on Tuesday, March 15, when Dr. A. P. Thurston, M.I.Ae.E. (Hons.), A.M.I.Mech.E., will read his paper entitled, "Some Points in Aircraft Structural Design." Members who would like to receive an advance copy of the paper, with a view to taking part in the discussion, should notify the Secretary.

DOUGLAS SHAW,
Secretary

An R.N. Armoured Car Lodge

IT is intended to found a Masonic lodge among the officers, petty officers and ratings who served during the War in the Royal Naval Armoured Car Division. Will those who are interested in the project, and particularly those who are Freemasons and would like to become founders, communicate with Lieut.-Commander W. Whittall, 14, Elm Bank Mansions, Barnes, S.W. 13 ?

Air Force Costs

IN written answers in Parliament last week, the Secretary of State for War gave the following figures as the estimated monthly cost of the Air Force at present in the places named :—Ireland, £33,000 ; Mesopotamia, £73,000 ; Palestine, £23,000 ; Constantinople, £3,000.

FLIGHT

AIRISMS FROM THE FOUR WINDS

ON Monday the French Civil Air Estimates, particulars of which were recently published in FLIGHT, came up before the Chamber. Having regard to our own outrageous estimates upon the Civil side and all that hangs to them, it is highly significant that the figures were adopted practically without a word of comment—the vote being passed immediately by a show of hands. During the morning session the Military Air Estimates were passed with equal absence of discussion. Comment would be superfluous. How our dear Allies must chuckle !

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LAST week the Paris Anglo-French-Belgian Air Conference came to an end, and the next meeting will be held in London during the first fortnight in April.

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COMMENTING in the same strain as FLIGHT has done in the past upon the absurdity and the harmfulness of the senseless air "stunts" indulged in by certain acrobatic perverts in America, in the form of jumping from one machine to another whilst in flight and similar abominations, our French contemporary *L'Auto* recently let itself go upon this same subject. Our contemporary rightly called upon the authorities to sit up and take notice that it was proposed by these suicide merchants to perpetrate the same follies in France for the acquiring of filthy lucre in the form of gate money. Fortunately over the water officialdom does not take a decade to grasp things of this sort, and so with promptness to be emulated in our bureaucratic circles the Service de la Navigation Aérienne has telegraphed to the Préfet of La Vendee, in whose district the opening exhibition was to be exploited, forbidding the performance to take place. We only hope that any attempt to transfer the same show to this country will be as effectually quashed by the proper authority.

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WHEN are *our* railway-men going to take the long view for air-travel in co-operation with present-day existing transport ramifications ? It is quite heartening to see that in the U.S. they are waking up to the enormous future and possibilities of the air-way, if only it be fostered in the right spirit. Mr. R. E. R. Cowie, President of the American Railway Express Company, in an address on Transportation delivered before 1,200 members of the Society of Automotive Engineers at their Annual Dinner, held at the Hotel Astor, New York, in January, was most emphatic in his views upon the subject.

"In my opinion, we—and I mean by 'we' the United States Government and all the citizens of this country," he said, "should adopt a consistent, forward-looking policy, amply supported by legislation which will ensure the immediate and vigorous growth of commercial aviation in the United States."

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MR. COWIE went on to say that he saw no reason why the United States Government should not give as much support to commercial aviation as it does to navigation, and that he believed that for the safety of the country, for its defence in time of war, and for its continued commercial prosperity, it was absolutely imperative that a system of commercial aeroplanes be developed which could be readily altered in two or three days so as to become effective weapons of war.

"If the occasion should arise when a large number of aeroplanes should be needed by the Government, either for commercial purposes or war, where could it get them today ? What provisions have been made for night-flying ? How many landing-fields have we that are suitably marked, lighted, supplied and equipped with directional wireless and all the other necessary aids to successful aero navigation ?" queried Mr. Cowie. "Why should not the Government," he urged, "control this in the same manner as it does our merchant marine, by providing laws, licences, suitable light-houses, maps, proper routes, life-saving apparatus, licensed pilots and all the other things that go to make up a successful working organisation ?"

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CURIOUSLY we thought, from the news-columns of our home contemporaries, all this sort of thing was in active operation out yonder, whilst here at home there is "nothing doing." But according to Cowie, "we have none of these today, and although America is the home of the aeroplane, and we have among our engineers some of the best designers and manufacturers of aircraft, nothing of importance seems to have been done to conserve the valuable aeronautical assets which we have."

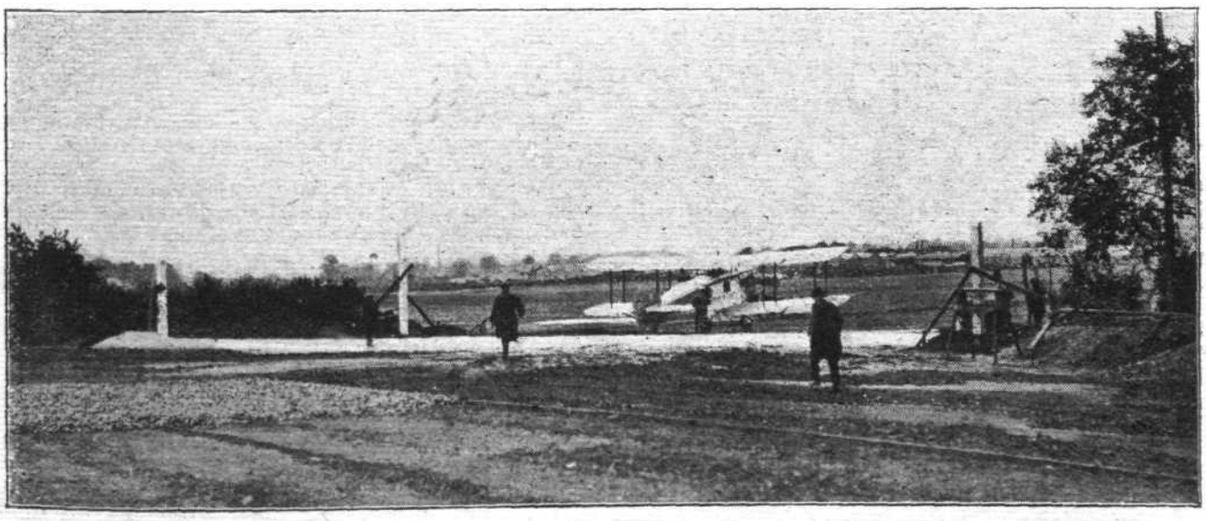
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SEEMINGLY, therefore, as we are credited in the States with the most wonderful commercial progress, we shall have to go to America to find out how we really *do* stand. Still Cowie is a kicker, and means keeping up his crusade—in which more power to his elbow. He concluded his advocacy of air progress as being helpful all-round to transport by saying : "I am a great believer in the future of aviation, and I believe the more we get behind it the more automotive vehicles of all kinds will be manufactured and sold. This country of ours is a great country of vast distances and unexplored resources, but it is a country where transportation is a paramount issue, where the transportation cost of articles makes up a large part of the selling price. For that reason, there lies in your hand a vast and far-reaching opportunity."

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A PARTY were visiting the aerodrome, and they stopped in front of a refractory engine on which a very oily A.M. was working. The leader of the sightseers said : "Will you tell us what you call this particular engine ?"

The A.M. grunted, wiped an oily hand across his brow and ventured : "D'ye mean its name, mister, or wot *I* calls it ?" —*Exchange*.



THE LEVEL CROSSING AT WADDON AERODROME : Lieut. Courtney taxying a Westland across the road which divides the Waddon aerodrome, what time the red-flag man holds up the approaching traffic.

NOTICES TO AIRMEN

Aerodromes for Civil Use : Amendment

NOTICE to Airmen No. 1 of 1921 (Aerodromes for Civil Use : Consolidated List) is amended as follows :—LIST C. Licensed Civil Aerodromes. Nuneaton aerodrome should be deleted.

Pilots' Licences : Compulsory Examination in Navigation

CORRECTION to No. 13 of 1921 :—

Please delete words " (para. 3 (2)) " in the fourth line of the first paragraph.

Wireless Direction Finding-Stations : Organisation and Procedure

IT is notified that the following D.F. Stations are available for use by aircraft, and are classified by countries :—

British Isles.—Station, Amlwch (call signal, BXV) and Rhyl (BZW) ; Berwick (BVG) ; Carnsore (BVZ) ; Croydon (GED) ; Flamborough (BVN) ; Lizard (BVY) ; Malin Head (GMH) and Seaview (BXK).

France.—Station, Barre de l'Adour (call signal, FEU) ; Ben Negro (FUA and FUB) ; Bernières (FEB) ; Berre (FED) ; Bizerte (FUB) ; Brest-Moulin du Seigneur (FEI) ; Casablanca D.F. (CNP) ; Cherbourg (FUC) ; Djidjelli (FEJ) ; Gris-Nez (FEN) ; Guipavas (FEG) ; Kenitra (CNK) ; Lorient (FUN) ; Ouessant (FFU) ; Penmarcl (FEP) ; Point du Raz (FER) ; St. Nazaire (FEZ) ; Sfax (FUS) ; Soubise (FES) ; Toulon-Liberte (FUT), and Treguier (FET).

Germany.—Station, Borkum (call signal FNR) ; List (VBD) ; Nordholz (MNF) ; and Wilhemshaven (KAN).

Italy.—Station, Murano (call signal IRM).

Radio-telephony enables aircraft equipped with the necessary apparatus to communicate with one another in the air or to speak to ground stations at any point in their journey. The subjects of converse are for the present to be restricted to the following : (*a*) bearings, whereabouts, etc. ; (*b*) weather (cloud, visibility, etc.) ; (*c*) landing conditions ; and (*d*) unforeseen occurrences, such as forced landings, requests for assistance, etc.

Authority.—Admiralty Notices to Mariners, Nos. 2031 of 1920, 2127 of 1920, and 190 of 1921 ; French Bulletin de la Navigation Aérienne, No. 9, December, 1920.

Cancellations.—Notice to Airmen, No. 107 of 1920, and Paragraph 4 of Notice to Airmen, No. 98 of 1920, are hereby cancelled.

(No. 17 of 1921).

Signposts for Airmen : Aerodromes, etc., Marked

A 1. WITH reference to Notices to Airmen, Nos. 4 of 1920 and 15 of 1921, the names of the under-mentioned aerodromes are marked as follows :—

A. In chalk letters on the ground : Andover, Biggin Hill, Bircham Newton, Croydon, Digby, Donibristle, Eastchurch, Farnborough, Gosport, Grain, Halton, Hawkinge, Henlow, Kenley, Leuchars, Lympne, Manston, Martlesham Heath, Netheravon, Orfordness, Shotwick, Smoogroo, Spittlegate, Stonehenge, Upavon and Worthy Down.

B. In white letters on the roofs of the sheds : Cranwell, Freiston, and Spittlegate.

2. The airship base at " Howden " has the name marked in chalk letters on the ground.

3. The stores depôt near Watford Junction has the name " Watford " marked in chalk letters on the ground.

4. Due notification will be given if other aerodromes, airship bases, or depots are marked.

(No. 20 of 1921).

Radio Telephony : Stations Available for Aircraft ; Organisation and Procedure

THE following radio-telephony stations are available for use by aircraft, and are classified by countries :—

British Isles.—Stations, Castle Bromwich (call sign GEC) ; Croydon (GED) ; Didsbury (GEM) ; Lympne (GEG) ; Pulham (GEP) ; Renfrew (GER).

Conversations by radio-telephony must be as brief as possible, and are to be confined for the present to the following subjects :—

(*a*) Whereabouts of aircraft.
(*b*) Weather conditions.
(*c*) Landing conditions.
(*d*) Unforeseen occurrences such as forced landings, requests for assistance, etc.

Belgium.—Station, Haren (call sign, BAV).

France.—Station, Le Bourget (call sign ZM) ; St. Inglevert (AM).

Holland.—Station, Soesterbert (call sign STB). (No. 21 of 1921.)

Howden : Flying of Kite Balloons

WITH reference to Notice to Airmen No. 85 of 1920 pilots are also warned that, in order to assist airships landing in thick weather, a kite balloon will be flown, when necessary, from the landing ground at Howden Airship Station, 17 miles S.E. of York (Lat. 53° 47′ 0″ N., Long. 0° 52′ 0″ W.) (No. 22 of 1921.)

Lympne Aerodrome : Cloud and Visibility Signals

1. THE following system of ground signals is in operation at Lympne Aerodrome, to denote to pilots the height of clouds above and visibility at Biggin Hill and Croydon Aerodromes.

2. The stations are denoted by letters :—B (representing Biggin Hill), and C (representing Croydon). The height of clouds and visibility are indicated by numerals. All signals are *white*.

3. Height of clouds are denoted by the following numerals : 1 = 0 to 200 ft. ; 2 = From 200 to 500 ft. ; 3 = From 500 to 1,000 ft. ; 4 = Above 1,000 ft.

These signals represent the height of clouds *above the respective aerodromes and not above sea level.*

4. Visibility will be shown in a similar way, viz., 1 = Below 500 yards ; 2 = 500 to 1,000 yards ; 3 = 1,000 yards to 2,000 yards ; 4 = Above 2,000 yards.

5. The signals are always displayed in the following order :—1. Station. 2. Height of Clouds. 3. Visibility, *e.g.*, B.1.2; or C.2.3.

6. The signals are situated approximately 30 yards east of the Office of the Civil Aviation Traffic Officer, and 140 yards west of the Compass Base. They are so placed as to be read the right way up when flying in a north-westerly direction.

7. *Cancellation.*—Notice to Airmen No. 90 of 1920 is cancelled as from March 1, 1921.

(No. 24 of 1921.)

NOTICES TO GROUND ENGINEERS

Correction

IT should be noted that :—

1. " No. 18 of the year 1921 " *should read* " No. 1 of the year 1921."

2. " No. 19 of the year 1921 " *should read* " No. 2 of the year 1921."

Le Rhone Engines (80 h.p. and 110 h.p.) : Weak Valve Rocker Support

THE original type of valve rocker support or Tee piece fitted to earlier engines of the above types has been found to be weak to an extent which renders the engine unairworthy unless fitted with safety clips of sheet steel to Air Ministry Drawing No. A.B. 3634.

Such clips must, therefore, be fitted in all cases where the above type of valve rocker support is fitted. In fitting these clips care must be taken to ensure that the holes for the pins through the fins on the cylinder heads are drilled in such a manner as to prevent the clips tearing away.

The defective type of Tee piece in some cases has been further weakened by the drilling of a tommy-bar hole at right angles to the housing of the horizontal bearing, and in all cases may be readily recognised, as the vertical stems are tapered instead of parallel.

This type should be replaced at the first opportunty by the English type, which has a parallel vertical stem drilled with a 10-mm. hole. (No. 4 of 1921.)

Dual Control in Passenger Aircraft

1. EXPERIENCE having shown that the presence in passenger-carrying aircraft of dual control, which can be interfered with by passengers, is a source of danger, it has been decided that the daily certificate required from a ground engineer will be held to have been given improperly in cases where an aircraft fitted with dual control is used for passenger carrying without proper arrangements being made for the prevention of interference with the dual control.

2. Suitable protection can be given by removing the control lever and by the provision of a suitable cover which will allow for the movement of the dual rudder bar, control link and cables, and by adequately protecting or disconnecting the dual ignition and engine controls.

3. This instruction is not intended to discourage the fitting of dual control, but merely to ensure that when a machine so fitted is used for passenger carrying the necessary precautions will be taken. (No. 5 of 1921.)

N.B.—This Notice was issued in circular form to aircraft owners in October, 1919.

Rolls-Royce "Eagle" Engines: Fitting of Epicyclic Gear

ROLLS-ROYCE "Eagle" engines fitted with high compression pistons will, in future, not be regarded as airworthy unless fitted with the modified epicyclic gear, incorporating friction damped control to the sump wheel. Engines provided with the old type epicyclic reduction gear can be accepted only with standard low compression pistons.

Engines in service which do not conform with the above conditions should be modified at the first opportunity.

A number of engines with the old type reduction gear have already been modified by the makers by fitting low compression pistons; such engines are stamped with the letter "K" on the name-plate above the maker's name. (No. 3 of 1921.)

Handley Page Service Stops

As was to be anticipated as being the only solution to the subsidy methods of France, side by side with our Government's fool game, the Handley Page London-Paris Service closed down on February 28. Now that million more or less for Civil Aviation should come in quite handily for helping along our Continental rivals to complete their efforts in making this country a back number in Civil aviation for a decade or so.

Some French Civil Flying Figures

LAST week-end at a gathering of about forty French Senators at La Bourget at the invitation of the new Under-Secretary for Aviation, M. Eynaer, during a short speech, said 1919 was a year of plans; 1920 a year of trial, and 1921 would be a year of realisation. Some suggestive figures were given in a summary of the French air position by Colonel Saconnet, director of the aerial navigation service, who also spoke enthusiastically of flying in France. He detailed the following comparative figures showing the increase in traffic on the Paris-London-Brussels, Bayonne-Bilbao, Toulouse-Casablanca, Paris-Cabourg routes.

Complete journeys, 1911, 173; in 1919, 4,473; in 1920, 4,428. The number of miles covered in 1919 was 333,823, and in 1920 989,272.

The number of passengers carried in 1919 was 729; and in 1920, 6,697.

Goods weighing 31,680 lbs. were carried in 1919, and 277,319 lbs. in 1920.

Mails weighing 1,048 lbs. were carried in 1919, and in 1920, 13,581 lbs.

He was also reassuring about the high degree of safety which had been reached, and pointed out that for 1,212,309 miles flown there had been only fourteen accidents and five deaths during the last two years. He also mentioned that one can fly from Paris to Warsaw *via* Strasbourg in twelve hours, whereas the train journey usually takes three days and two nights, and the price, when one includes the cost of sleeping-car accommodation, is no lower than the cost of going by air, which is about £20.

And as to Britain? With the last of our civil aviation services—the H.P.—closed down, best to draw the veil—or is it a shroud?

Air Mail to Morocco

No doubt by reason of the generous subsidy by France to French civil aviation, our Postmaster-General is able to announce the reduction, beginning on March 3, of the special air fee payable, in addition to ordinary foreign postage, on packets posted in this country for Morocco, and intended to be forwarded by the French Air Mail Service from Toulouse to Casablanca. The limit of weight per packet has, on the other hand, been increased. The new rates will be as follows:—

For packets weighing up to ½ oz., 5*d.*; from ½ oz. to 3½ oz., 11*d.*; for each additional 3½ oz., an additional 6*d.*, up to a maximum weight of 17½ oz., and a corresponding fee of 2*s.* 11*d.*

The air mail is due to leave Toulouse at 7 a.m. on Mondays, Wednesdays, and Saturdays, and to reach Morocco the following afternoon; and the latest time of posting to connect is 3 p.m. (printed papers, commercial papers, and samples, 2.30 p.m.), at the General Post Office, London, on the preceding Saturday, Monday, or Thursday, and at corresponding times elsewhere. The mail aeroplanes call at Rabat on the way to Casablanca.

International Fares to be Reduced

ANOTHER result of the Continental civil aviation subsidies is echoed in the following decisions, arrived at on February 28 in Brussels by the International Conference of the principal aerial transport companies there assembled:—

(1) To make a substantial reduction in charges, particularly in the case of passengers, so that they shall compare favourably with the maximum rates charged by the railway companies for international traffic.

(2) To open on April 14 an aerial route between Paris, Brussels, and Amsterdam, with a subsequent extension to Copenhagen *via* Bremen and Hamburg.

(3) To arrange for the London-Brussels service to call at Ostend during the season.

The Bristol "Tramp"

AMONG the few firms which are still busy on aircraft construction is the Bristol Company who, in addition to a large Air Ministry order for Bristol Fighters, are engaged on the construction of a new triplane, somewhat on the lines of the luxurious Bristol "Pullman," except that it is not designed to carry passengers. The *fuselage* is very roomy, so as to provide ample space for cargo. The power is to be furnished by four Siddeley "Puma" engines of 230 h.p. each, and the carrying capacity of the machine will be in the neighbourhood of 2½ tons. The speed will not, of course, be as high as that of the Pullman, the power being much smaller. The Air Ministry are said to contemplate various uses for this machine, such as carrying spare parts from one air station to another. If desired, the machine could also be used for wireless experiments, photography, etc.

A Vickers Red Cross Machine

AT the Weybridge works of Messrs. Vickers, Ltd., a new machine is now nearing completion which is designed for Red Cross work. The machine is more or less on standard Vimy lines, but in place of the usual seats the cabin is fitted up to take four stretchers, and there is also room for a doctor, nurse, and orderly. Thus urgent cases can be transported great distances in a very short time and with a maximum of comfort.

Armstrong Whitworth Aircraft

SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT, LTD., is the title of a new company just formed by Messrs. Sir W. G. Armstrong, Whitworth and Co., Ltd., for the development of their aircraft programme. The company is developing new types of aircraft, and in due course will be in a position to supply various types of aircraft of entirely post-War design suited to meet varying requirements. The formation of this new Company will in no way interfere with the production and design of aircraft engines by Messrs. Armstrong Siddeley Motors, Ltd.

Belgian Congo Waterplane Service

IN connection with the inaugural flight of waterplanes up the Congo, recently referred to in FLIGHT, a correspondent of *The Times* writes that the difficulties confronting a newly established air service in a remote part of the world are now illustrated by the actual experience reported in connection with this pioneer airway. The service, which uses seaplanes, and follows the course of the River Congo between Kinshasa and Stanleyville, is operated by the Syndicat National pour l'Etude des Transports Aériens.

One of the main difficulties encountered has been in connection with possible forced landings through mechanical trouble. Sections of this airway are so isolated, and ordinary communications are so bad, that there is a risk of a machine which has alighted involuntarily never being heard of again; in any case, days may elapse, perhaps, before news comes through of what has happened.

To overcome this difficulty, temporarily, the expedient had been adopted of dividing a load between two seaplanes, which then set off together and keep each other company during their flight. In this way, should one have to alight through any mechanical trouble, the other either flies on, or returns, and reports accurately and promptly the position of the stranded machine.

A scheme is now being pushed ahead to establish wireless telephones along the Congo, and also in the aircraft, though the ground organisation will not be an easy matter. For one thing, white labour is so scarce that intelligent negroes will have to be trained to "listen in" at, and to use, the wireless telephone instruments. Another difficulty, experienced in the afternoons, is that the tropical heat causes "atmospherics" which may interfere with the wireless.

THE ROYAL AIR FORCE

London Gazette February 22

Permanent Commissions

Flying Offr. J. H. Amers is granted a permanent commn. (from Stores Branch) as a director of Music and Flying Offr., retaining his present sen.; Nov. 20, 1920. The following are restored to the Active List.—Flt. Lieut. K. M. St. C. G. Leask, M.C., Flying Offr. J. H. Jephson; Feb. 8.

Stores Branch.—Flying Offr. J. H. Amers is granted a permanent commn., retaining his present sen.; July 22, 1920.

Short Service Commns.—The following are granted short service commns. as Flying Offrs., retaining their original sen., in the substantive rank last held prior to the grant of these commns.—C. W. Usher; Feb. 8. F. J. Islip; Feb. 8.

The names of Flying Offr. James Leonard Neville Bennett-Baggs are as now described, and not as *Gazette*, Sept. 16, 1919.

Reseconding.—Flt. Lieut. J. S. Holloway (Capt., (Capt., Dorset R.) is reseed. to the R.A.F. for a further period of two years: Aug. 1, 1919 (substituted for *Gazette*, April 27, 1920).

Flying Branch

Lieut. E. H. Colman to be Lieut. (A.), from (T.); Jan. 2, 1919 (substituted for *Gazette*, July 29, 1919). Sec. Lieut. R. T. Thacker is antedated in his appt. as Sec. Lieut. (A.); Aug. 5, 1918. Lieut. O. J. Rose, D.F.C., relinquishes the acting rank of Capt. (A.) on ceasing to be emplyd. as Capt.; April 4, 1919. Lieut. R. T. Edwards, A.F.C., relinquishes his temp. commn. on appointment to T.F., and is permitted to retain his rank. Observer Offr. J. M. Godfrey (Lieut., R.A.) relinquishes his temp. commn. on return to Army duty; Jan. 25.

The following are transfd. to the Unemployed List.—J. R. Williams; Jan. 26, 1919. J. T. Rose; July 13, 1919.

The Christian names of Lieut. Vyvyan Underwood Tennant Watson are as now described, and not as *Gazette*, Dec. 14, 1920.

Administrative Branch

Pilot Offr. P. G. Whittle to be Flying Offr.; Jan. 21. Lieut. A. Colling relinquishes his temp. commn. on appt. to T.F. Reserve, and is permitted to retain his rank. Capt. H. K. Pearce relinquishes his temp. commn. on ceasing to be emplyd.; Nov. 26, 1919 (substituted for *Gazette*, Feb. 27, 1920).

Transferred to the Unemployed List.—Sec. Lieut. E. R. Payne; Mar. 6, 1919. Lieut. W. J. Barker; Dec. 16, 1919 (substituted for *Gazette*, Jan. 2, 1920).

Technical Branch

Pilot Offr. F. W. Taylor to be Flying Offr; Oct. 1, 1919. Sec. Lieut. (Hon. Lieut.) E. H. Colman to be Lieut.; April 2, 1918. Capt. S. Clark to be actg. Maj. whilst empld. at the Ministry of Munitions from April 1, 1918, to April 18, 1918.

Memoranda

One Overseas Cadet is granted a temp. commn. as Sec. Lieut.; Feb. 15, 1919.

Sec. Lieut. L. Knight relinquishes his commn. and is permitted to retain his rank; Mar. 29, 1919.

London Gazette, February 25

Air Marshal Sir H.M. Trenchard, Bt., K.C.B., D S.O., is appointed principal Air Aide-de-Camp to the King; Feb. 22.

Permanent Commissions

Stores Branch.—Flying Offr. J. Baxter is placed on retired list; Feb. 26.

Flying Branch

Sec. Lieut. G. S. Scott to be Lieut.; Jan. 19, 1919 (substituted for *Gazette* July 29, 1919). Capt. A. Durston, A.F.C., is graded for pay and allces. as Maj. (S.), from May 1, 1919, to July 31, 1919 (substituted for *Gazette*, May 4, 1920).

The follg. Lieuts. relinquish their temp. commns. on appt. to T.F. Res., and are permitted to retain their rank.—C. H. Beldam, A. T. Daw. Lieut. R. J. Thompson relinquishes his temp. commn. Sec. Lieut. J. B. Norton is transfd. to Unemployed List; June 11, 1919. Lieut. D. W. Hardy is transfd. to Unemployed List; Sept. 7, 1920 (substituted for *Gazette*, Sept. 14, 1920. Lieut. D. W. Hardy is restored to Active List; Feb. 15. The Christian names of Lieut. Vyvyan Underwood Tarrant Watson are as now described, and not as *Gazette*, Dec. 21, 1920. *Gazette*, Sept. 24, 1920, relating to Flying Offr. H. L. Rough, D.F.C., is cancelled. *Gazette*, Sept. 17, 1920, stands.

Administrative Branch

Lieut. P. H. G. Southwell relinquishes his temp. commn. The following Sec. Lieuts. relinquish their temp. commns. on return to Army duty.—F. Moss; April 6, 1918. H. S. Prowse; April 20, 1918. R. W. Medcalf, W. D. Pirie, C. W. Rourke, N. C. F. Scarborough; May 4, 1918. G. R. Marsden; May 28, 1918. C. J. Hooley; Aug. 10, 1918. A. G. Franklin; Sept. 7, 1918. W. J. McKinley; Sept. 21, 1918. B. W. N. Still; May 4, 1919.

Technical Branch

Sec. Lieut. F. G. Thompson is transfd. to the Unemployed List; Sept. 28, 1919. The name of Sec. Lieut. (Hon. Lieut.) H. D. Cope is as now described, and not "Cape," as *Gazette*, April 11, 1919.

Memoranda

Lieut.-Col. A. Fletcher is granted the rank of Actg. Col. on relinquishing the appt. of Director and whilst employed as a Deputy Director from May 1, 1919, to June 30, 1919. Lieut.-Col. W. G. S. Mitchell, D.S.O., M.C., A.F.C., is graded for pay and allces. as Col. (Staff) whilst so employed from May 1, 1919 to June 9, 1919.

Four Cadets are granted hon. commns. as Sec. Lieuts., with effect from the date of their demobilisation.

The King's Levee

AMONGST those who attended the Levee on March 1 were Squadron-Leader A. R. Boyle, O.B.E., M.C.; Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E.; Squadron-Leader A. Ellis; Air-Commodore F. C. Halahan, C.M.G., D.S.O., M.V.O., Group-Capt. P. L. W. Herbert, C.M.G., C.B.E.: Squadron-Leader R. B. Maycock, O.B.E.; Air Vice-Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O.; Flight-Lieut A. H. Stradling, O.B.E.; Air-Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O.

Amongst those presented to H.M. the King were Flight-Lieut. F. P. Adams; Flight-Lieut. E. J. Cuckney, D.S.O.; Flight-Lieut. E. C. Emmett, M.C., D.F.C.; Sir Wm. Joynson Hicks, Bart., M.P.; Squadron-Leader Roderic M. Hill, M.C., A.F.C.; Flight-Lieut. E. J. Hodsoll; Wing-Comdr. C. T. Maclean, D.S.O., M.C.; Squadron-Leader H. R. Nicholl, O.B.E.; Squadron-Leader K. R. Park, M.C., D.F.C.; Wing-Comdr. W. H. Primrose, D.F.C.; Flight-Lieut. P. S. Jackson-Taylor; Squadron-Leader R. P. Willcock.

The S.B.A.C. Help R.A.F. Memorial Fund

COLONEL BURCH, the Secretary of the Royal Air Force Memorial Fund Committee, informs us that a most acceptable donation of £1,910 has been made to the Funds through the Society of British Aircraft Constructors, as a subscription from various aircraft manufacturers. Certain other firms have sent direct subscriptions amounting to £111, so that in all aircraft firms have contributed a total of £2,021.

It is felt that this donation is more praiseworthy because the aircraft industry is in such perilous plight, that many firms are struggling to keep in existence, and that many others have been forced to cease their activities. The Society of British Aircraft Constructors has gone to an infinite amount of trouble to raise subscriptions to what they have felt is such a worthy object, and they will be the more gratified to know that immediate and effective use of the funds is recorded in the minutes of the last Meeting.

An Enterprising Rural Councillor

MR. W. BULLIVANT of Old Windsor, on February 23rd, in order to attend a meeting of the Windsor Rural District Council, flew by aeroplane from Paris. Needless to say, his arrival created quite a stir in the sombre surroundings of the Old Windsor workhouse. After the meeting Mr. Bullivant again left by aeroplane for France, *en route* to Italy.

A Souvenir of the War

WE have received an interesting souvenir of the War in the form of an artistically and luxuriously got up volume containing a record of the 94 Gift Battleplanes which were presented to the Imperial Government by Australia and Malaya in response to appeals organised by Mr. C. Alma Baker, C.B.E. In addition to numerous photographic reproductions of all the various types of machines presented—in most cases of the actual machine itself—together with a list of donors, there is an article, illustrated with reproductions of pictures by Mr. Fred Leist and Mr. Joseph Simpson, by Lieut.-Col. E. A. Ewart (Boyd Cable) on "The Presentation Planes: Their Use and Value." Copies of this work, which is a gratifying record of but a small quota of the excellent work done by our Colonies during the Great War, have been accepted by Their Majesties the King and Queen, H.M. Queen Alexandra, H.R.H. the Prince of Wales, the Duke of York, and the Duke of Connaught. It is altogether a valuable tome, which should take its place in the history of War work.

New French Military Aeroplane

FROM France it is reported that the *Eablissement* Schneider, at Creusot, are hard at work on a new four-engined military aeroplane, in which the four engines will be arranged in tandem inside a central *fuselage*. The wing span will be about 100 ft., and the power plant is to consist of four engines of 400 h.p. each. The machine will be designed for bombing work, and will carry several machine guns. The Goliath pilot, Lieut. Gonin, has been engaged to test the first machine, while it is possible that Casale, who has already tested the Blériot *Mammouth*, will test the second machine.

The Oehmichen Helicopter

M. OEHMICHEN continues his tests with the small helicopter referred to in FLIGHT recently. He has now made several ascents without accident, thanks to the small balloon which is attached to the helicopter and which serves to stabilise rather than lift it, the total lift of the balloon being 71 kilos. only, while the weight of the machine, with pilot on board, is 336 kilos. The weight supported by the screws is thus 336 — 71 = 265 kilos., or 10.6 kilos. (23.3 lbs.) per h.p., the machine being fitted with an old Dutheil-Chalmers two-cylindered engine of 25 h.p.

PERSONALS

Married

Capt. CYRIL RICHARDS, late R.F.C., son of D. T. Richards, Esq., M.D., J.P., was married on February 5, at the British Consulate, Casablanca, Morocco, to the Hon. Mrs. ROBERT FRENCH, widow of Col. the Hon. Robert French, and daughter of the late Hugh Mair.

FRANCIS HARBROE SHALES, R.A.F., was married on February 17, at Marylebone Parish Church to SYLVIA VIOLET, daughter of Mr. and Mrs. J. C. WARNER, St. Mary's, Winchester.

Lieut. ARTHUR JACK GRAHAM STYRAN, M.C., A.F.C., R.A., and R.A.F., son of the late Captain J. H. Styran, R.A., was married on February 15, at Mitford Parish Church, to VIOLET EDITH MITFORD, youngest daughter of Robert Osbaldeston-Mitford, Esq., of Mitford Castle, Northumberland.

Capt. WILLIAM RODNEY WINTERBOTTOM, late R.A.F., youngest son of Col. and Mrs. Winterbottom, of Aston Hall, Derby, was married on February 8, in Bermuda, to MARY, daughter of GIBSON WARD, Esq., of Bermuda.

To be Married

The marriage arranged between Maj. H. GRAEME ANDERSON, M.B.E., M.D., F.R.C.S., Surgical Consultant to the Royal Air Force, of 75, Harley Street, W., and GLADYS, elder daughter of CHARLES HOOD of Hatch End, Middlesex, will take place on March 18, at St. Columba's (Church of Scotland), Pont Street, S.W., at noon.

The marriage arranged between Flying Officer JOSCELYN EDELSTEN, R.A.F., Amaza, Egypt, and Miss LILYAN GRACE SMITH, The Oaks, Burton-on-Trent, will take place in Cairo at the end of March.

The engagement is announced between Flying Officer HAROLD WILLIAM GARDNER, R.A.F., only son of William John and the late Rosina Sophia Gardner (*née* Hanscomb), of Croydon, Surrey, and MURIEL JOYCE DURHAM, only daughter of the late George Emanuel Durham and Mrs. John Edward Summerfield (formerly Durham), also of Croydon, Surrey.

An engagement is announced between Flying Officer KENNETH ALEXANDER MEEK, M.B.E., R.A.F., only son of Mr. and Mrs. Herbert Meek, of Hull, and grandson of the late Alexander Meek, of Goole, and MARY VICTORIA BIRD, second daughter of C. W. PEARCE, Mus.D. Cantab, and Mrs. PEARCE, of 18, The Vale, N.W. 2.

The marriage of Mr. J. R. POTTER (late Major, R.A.F.) and Mrs. O. R. THOMAS will take place at St. Mark's Church, Surbiton, on Thursday, March 3.

The engagement is announced between HENRY RALPH STANLEY, late of the Royal Warwickshire Regt. and R.A.F., elder surviving son of Mr. and the Hon. Mrs. Birkin, of Park House, Mapperley, Nottingham, and eldest grandson of Sir Thomas and Lady Birkin, of Ruddington Grange, Notts., and AUDREY CLARA LILIAN, younger daughter of Sir Thomas and Lady LATHAM, of Crow Clump, Weybridge, Surrey.

Items

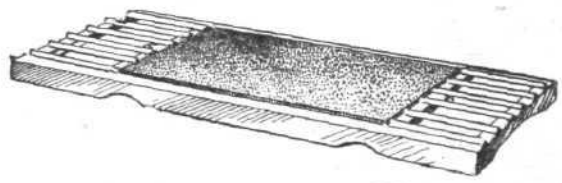
Air-Commodore ROBERT MARSLAND GROVES, C.B., D.S.O., of Two Gables, Penn Road, Beaconsfield, who was killed from the result of a crash in Egypt on May 27, son of the late James Grimble Groves, M.P., of Salford, Lancs., has left property of the value of £35,977.

Miss IMELDA MARY TRAFFORD, who was killed in the aeroplane smash at Hayes, Middlesex, last September, when four other people lost their lives, and who was the first lady to qualify for the Air Ministry "A" certificates issued to women pilots, left £1,306. She was a grand-daughter of the seventh Baron Petre.

THE COAN STEP-MAT AND SCRAPER

ONE of the things which make all the difference to the appearance of any car is a step-mat. but, to be really effective, it must be properly made and fitted. These two conditions are easily met by the new aluminium step-mat and scraper which is being placed on the market by Mr. Robert W. Coan, of 219, Goswell Road, E.C. 1. Our sketch shows the general arrangement of the device, which consists of an aluminium frame, in the centre of which is a good-quality fibre mat. At each side there are half a dozen ridges, making most effective scrapers, any mud or road-dust falling into an open space beneath, whence it can be washed away easily, through spaces at the side, when the car is cleaned.

It is almost needless to add that, coming from such an expert craftsman in the manipulation of this metal as Mr. Robert Coan, the aluminium frame is all that it should be; the casting is faultless, and its appearance is enhanced by the fact that it is polished. It is attached to the running-board by two bolts and nuts, so that when necessary it may be easily removed for cleaning. The mat, which, as we have said, is of fibre, is specially made with the base a little larger than the "working" portion, so that while the latter comes



The New Coan Aluminium Step-Mat and Scraper.

through the frame the mat itself is held securely, by its edge, in the recess in the aluminium frame.

The size is 18½ inches by 8½ inches, and as the retail price is only 25*s*. 6*d*., there should be a good demand for these fitments.

Across the U.S. in Thirty-Three Hours.

How the U.S. post office is consistently encouraging airborne mails is exemplified in the latest feat under its auspices announced from New York. The test was to convey six sacks of mails from San Francisco to New York by aeroplane, and this was accomplished in an elapsed time of thirty-three hours. Letters were actually delivered to the addresses thirty-seven hours after they were posted on the other side of the American continent.

The total distance, which was covered by relays of aeroplanes, was 2,666 miles. The actual flying time was twenty-five hours fifty-three minutes, and the average speed one hundred and three miles an hour.

One of the pilots, Mr. Jack Knight, made a thrilling night flight from Cheyenne (Wyoming) to Chicago (eight hundred and thirty-nine miles). Although he had never been over the ground before, he made the journey in perfect time without any mishap. On the way he made three landings in the dark to take up mail, flew through three snowstorms, and frequently encountered fog.

This latest feat of the air mail service surpasses all previous achievements. The quickest time hitherto recorded for trans-continental mail was seventy-two hours by a combination of special mail train and aeroplanes. Before the introduction of aircraft on the Atlantic-Pacific mail route it took four and a half days for letters to travel from New York to San Francisco.

Another Pacific Coast Flip

IT is announced unofficially from Jacksonville, Florida, that Lieut. W. D. Coney has flown there from San Diego, California, a distance of 2,079 miles in 22 hours 32 minutes actual flying time.

Newfoundland for Air-Mail

FROM St. John's the Post Office authorities announce the inauguration at an early date of an air-mail service in the north portion of the island. Only the usual postal rates are to be charged.

SIDE-WINDS

ON February 17, the senior staff of the Wolseley Co. were entertained at dinner by the directors, Sir Vincent Caillard, the Chairman of the Company, presiding. During the evening the managing director, Mr. A. J. McCormack, was presented with a Queen Anne silver service and an illuminated address, in the form of a specially bound album, on behalf of the directors and senior staff. Sir Vincent Caillard, in making the presentation, said that they felt that the services rendered by Mr. McCormack to the country during the great War had never been sufficiently recognised. When the call came to transform the Wolseley works into a war factory, Mr. McCormack went into it with such energy and determination and such ability, that in a very short time the Wolseley became one of the most efficient munition-making firms in the country. Four thousand "Wolseley" vehicles were in use during the War, and a full supply of spares for these was steadily maintained. "Wolseley-Viper" aero engines were also turned out at a progressive rate, rising eventually to an output of sixty per week, a fact which had a vital effect on the fortunes of this country during the critical months of March and April, 1918. So successful were these engines, that when the Air Board, in 1918, with a view to future requirements, formed a group of five companies to manufacture the Pacific type of engine, the Wolseley Co. were made the controlling company of the group, with Mr. McCormack as chairman. Director firing gear, for the Navy, a most delicate form of mechanism at which many firms had failed, was produced successfully and in great numbers by the Wolseley factories, for which they were specially commended by the Admiralty. About three million shells were also produced. A separate aeroplane factory was erected, with a large output, and airship engines and mechanism were also produced. The technical and managerial responsibility for all this work rested entirely on Mr. McCormack, and he had great pleasure in asking him to accept this presentation on behalf of the directors and staff, as some recognition by them of his services to the country. Mr. McCormack, in reply, said that the credit for what he had done should be shared equally by the members of his staff, and he thought no recognition was necessary. He had been over-ruled on this point, but he preferred to look upon the presentation as a mark of their personal esteem.

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IT is with considerable pleasure we learn from Mr. H. S. Saunders, that Mr. Saunders, Senr., who has been so active in matters aeronautical at East Cowes, both in connection with the "Kittiwake" Flying Boats and "Consuta" plywood, specially suitable for *nacelles* and floats, is once again convalescent and able to attend business. The latter should, however, be qualified, as Mr. Saunders is restricted to a few hours only per week by his medical adviser. His numerous friends will wish him speedy resumption to "full time."

A CAR OF SOLID VALUE

AT the 1919 Motor Show, probably the best value for money was the Armstrong-Siddeley car, which then made its *début* to the public. Since then, it has more than justified the high opinion which it created, and what should specially interest our readers is that, following the rush of orders and subsequent increases of production-costs, the Armstrong-Siddeley car always kept their price to the public down to the lowest possible figure permissible under economic production. And in no case was an advance price asked of those who had booked their orders. Strong points to remember. In like manner today it would not be possible to point to a car carrying greater value for money than this well-featured carriage, whilst the price remains as ever at a moderate figure, notwithstanding that several "accessories" and refinements have since been added.

The best idea of its money value is perhaps gained by comparing the price of the chassis with that of the pre-War model—the 30 h.p. 6-cylindered—which it superseded. The price of the pre-War chassis complete with electric lighting and self-starter was £720.

The present chassis is provided with further equipment valued approximately as follows:—Wings, steps and valances, £50; spare tyre, £15; clock and speedometer, £10; making a total approximate value of £795.

The price of the present chassis complete with these extras and—with all the improvements in design and material derived from seven years' further experience and in spite of the heavy increases in wages and costs of material—is £875—or only 10 per cent. more than the price of the earlier model. Another point to be remembered is that owing to its lightness—due to advanced design and superior material—the Armstrong-Siddeley 6-cylinder is also moderate in running costs.

So many readers of FLIGHT are motorists that no excuse is necessary for drawing attention to the above facts, especially now when circumstances are such that almost every buyer of a motor-car is bound to consider closely the question of both initial cost and subsequent running expenses.

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Fatal Accident at Farnborough

FLYING OFFICER L. G. SPINNEY, R.A.F., a native of Wembley, who had seen service in France, was killed in a flying accident at Cove, near Farnborough, on February 24, while flying with Observer Officer Hesketh. The latter, except for a few scratches, escaped injury, as the crash which killed his companion threw him over the side of the *fuselage* and so saved his life.

Sea Fruit

THAT was a grim haul of the trawler "Masterpiece," last week, while fishing off Littlestone, near Dungeness, when she found in her net the wreckage of the forepart of an aeroplane and engine, the brass plate on the engine bearing the inscription, "Rolls-Royce, series 3, Falcon No. 2137. Full 6 h.p., 264 revolutions per minute, normal air screw 1179."

The framework of the machine was twisted into fantastic shapes and encrusted with shells and seaweed. The aluminium cases of the front of the engine had been eaten away by the action of the sea salt.

It is suggested that this is the engine of the machine lost off the Kent coast in May, 1919. Captain M. Evans, Lieut. H. Stokes, and Sergeant F. Fillmore, all of the Royal Air Force, were flying from France, and when near the English coast their machine fell into the sea.

Their bodies were found in the sea next morning not far from where the engine was recovered, on February 22.

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IN PARLIAMENT

Aircraft

MR. RAWLINSON, on February 21, asked the Secretary of State for War whether aeroplanes are taking little or no part in the military operations in Ireland; whether their assistance would be valuable in discovering and, if necessary, breaking up ambushes; whether there is any order or regulation which hampers their use for such purposes; and whether the military authorities have full control over the use of the aeroplanes?

Sir L. Worthington-Evans: The aircraft in Ireland is employed in carrying out important work in connection with military operations. Their value in dealing with ambushes is fully realised by the Commander-in-Chief, and when it is considered advisable to employ them in this way they are so utilised. The military authorities have full control over the use of aeroplanes.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motors

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1919

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2,372. H. E. S. HOLT. Parachutes. (158,283.)
20,865. L. EDWARDS. Weather-proofing of aerial propellers, etc. (158,292.
27,173. C. CLEGHORN. Balloon, etc., fabric. (158,366.)

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